

Q.338.96897
M2915d

MALAWI GOVERNMENT

**MINISTRY OF NATURAL
RESOURCES**

Development Policies and Plans

1965-69

2780 12/10/69

MALAWI GOVERNMENT

MINISTRY OF NATURAL RESOURCES

DEVELOPMENT POLICIES

AND

PLANS

1965 - 1969

MINISTRY OF NATURAL RESOURCESTABLE OF CONTENTS

	<u>TITLE</u>	<u>PAGE</u>
<u>SECTION A</u>	<u>ORGANISATION AND DEVELOPMENT OBJECTIVES</u>	
	Ministry of Natural Resources - Organisation and Development Objectives	1
	Ministry Organisational Chart	4
	Ministry Establishment Chart	5
	Department of Agriculture	6
	Farmers Marketing Board	10
	Central Farmers Loans Board	12
	Department of Veterinary Services, Animal Husbandry and Fisheries	13
	Fisheries Division	14
	Department of Forestry and Game	17
	Department of Geological Survey	20
<u>SECTION B</u>	<u>DEVELOPMENT PROJECTS</u>	
	<u>INTRODUCTION</u>	
<u>SCHEME NO.</u>	<u>AGRICULTURE</u>	
3/62	Phytosanitary Inspection Services	22
2/64	Ox Dam Building Units	22
2/65	Increased Usage of Fertilizer and Improved Seed	23
51/64	Farm Development	23
17,18/65	Dam Construction	25
24/62, 16/65	Agricultural Research	25
13/65	Extension Aids	26
2/63, 28/64, /65	Bunda College of Agriculture and Bunda Farm	28

TITLEPAGESECTION B DEVELOPMENT PROJECTS (Continued)SCHEME NO.

11,12/65, 9/61	Farm Institutes	28
15/65	District Training Centres	29
3/64	Buses for Agricultural Training Centres	30
1/65	Cotton Development	30
50/64	Tea Development	31
9/65	Turkish Tobacco Development	31
10/65	Increased Livestock Production	32
7/65	Sugar Smallholders Scheme	32
8/65	Rubber Smallholders Scheme	32

VETERINARY SERVICES, ANIMAL INDUSTRY AND FISHERIES

161/62	Control of Disease	33
162/62	Cattle Marketing and Holding Ground	33
101/65	Cattle Marketing	34
103/65	Livestock Improvement	34
102/65	Disease Control	35
6/65	General Fisheries Development	36
4/63	Fish Marketing (Lake Chilwa)	36
3,4,5/65, 22/62	Training Institute for Fishermen	37

FORESTRY AND GAME

57,58,59, 60/65	Afforestation Units	38
47/64, 61/65	Vipya Pulpwood Plantations	38
62/65	Forestry Research	39
63/65	Forestry Training	39
64/65	Sawmilling	39
65/65	Honey and Wax Production	40
66/65	Development of Game Reserves	40

SECTION B DEVELOPMENT PROJECTS (Continued)

SCHEME NO.

GEOLOGICAL SURVEYS

65A, 66A, 67, 68/65	Economic Mineral Survey	41
------------------------	-------------------------	----

LANDS AND SURVEYS

71/65	Aerial Surveys	42
16/62	Acquisition of Land for Settlement	42

SECTION C THE NATURAL RESOURCES OF MALAWI

Population	43
Land and the Economy	43
Maize	44
Tobacco	44
Burley Tobacco	44
Flue-Cured Tobacco	45
Dark Fired Tobacco	45
Sun/Air Cured Tobacco	46
Turkish Tobacco	46
Tea	46
Cotton	46
Groundnuts	47
Rice	47
Pulses	48
Sugar	48
Coffee	48
Tung	49
Livestock	50
Fish	52

	<u>TITLE</u>	<u>PAGE</u>
<u>SECTION C</u>	<u>THE NATURAL RESOURCES OF MALAWI (Continued)</u>	
	Forestry and Game	52
	Plantation Management	52
	Outturn from Plantations	53
	Training	53
	Production and Trade of Forest Products	54
	Construction Timber and Boxwood	54
	Pressure Treated Poles	55
	Future Revenue	55
	Future Plans for an Export Pulp Industry	55
	Geological, Principal Minerals	56
	Abrasives	56
	Apatite	56
	Bauxite	56
	Dolomite	56
	Graphite	56
	Ilmenite and Rutile	57
	Kyanite	57
	Limestone	57
	Mica	57
	Monazite	57
	Pyrochlore	58
	Strontianite	58
	<u>APPENDIX</u>	
	<u>TABLES OF STATISTICS</u>	
Table	I Land Usage	59
Table	II Production of Principal Crops	60
Table	III Values of Agricultural Production	61
Table	IV Crop Production and Forecasts	62

TITLE

PAGE

APPENDIX (Continued)

Table	V	Livestock Population	63
Table	VI	Incidence of Animal Diseases	64
Table	VII	Livestock Slaughtered	65
Table	VIII	Imports of Meat	66
Table	IX	Imports of Live Cattle	67
Table	X	Export of Hides and Skins	68
Table	XI	Production of Fish	69

SECTION A

ORGANISATION

AND

DEVELOPMENT OBJECTIVES

THE MINISTRY OF NATURAL RESOURCES

SECTION A

ORGANISATION AND DEVELOPMENT OBJECTIVES

The Ministry of Natural Resources is charged with administrative responsibility for the following sectors of Government activity :-

Agriculture including Animal Husbandry

Forestry and Game

Veterinary Services

Fisheries

Geological Survey

Land Survey

Land Matters and Mining

Crop Marketing

Farmers Loans and Credit Services

The Ministry comprises an organisation of technical departments and associated Boards the activities of which are administratively co-ordinated in support of Government's policy to secure a rapid and significant expansion of the economy.

The policy of the Ministry of Natural Resources is to develop fully the natural resources of the rural areas of Malawi by such means and in such a manner to ensure the greatest degree of lasting benefit for all its people.

To achieve this aim the following development objectives have been established :-

DEVELOPMENT OBJECTIVE NO. 1

ECONOMIC PRODUCTION

It is the intention to promote effective methods of increased production and improved quality in all agricultural crops, commercial forestry plantations, livestock and fisheries by more economically effective systems of farming and methods of production. The Development Programme of the Ministry of Natural Resources is particularly designed to establish a more progressive, intensive and economically viable pattern of resource use and crop production. Initial emphasis is being given to the urgent task of expanding the agricultural economy and of raising the average farmer from his present semi-subsistence level into that of a cash economy. This will be achieved through the proper utilisation of land, by encouragement and advice from an active extension service and through the provision of subsidies and credit facilities. Whilst the agricultural economy is being expanded through the increased production of economic crops and other products for which export markets exist or of food crops grown to support better standards of nutrition, continued attention is being given to future diversification through the controlled introduction of new crops and of improved varieties of existing agricultural crops, forest trees and livestock.

DEVELOPMENT OBJECTIVE NO. 2

RESEARCH AND INVESTIGATIONS

With the objective of increasing economic production of all agricultural products, the research programme will include projects in all natural resource fields. This programme is designed to meet immediate development requirements particularly in the field of crop and animal husbandry, forest management, fisheries development, disease control and the fullest utilisation of the land.

Long term research will support the future development of the agricultural industry with the object of assuring optimum economic yields and of establishing the most effective system of management. Systematic geological surveys of the country will continue at an accelerated rate to provide data for a sound assessment of mineral potential, groundwater resources and various related aspects of economic planning. Mineral prospects will be investigated and their value assessed. Their economic development will be encouraged with the aim of diversifying the national economy.

DEVELOPMENT OBJECTIVE NO. 3

CONSERVATION

It is intended to establish a pattern of progressive, planned land use and land management designed to facilitate the optimum use of land to the greatest benefit of the people, and, wherever possible to maintain and improve the climatic and physical conditions of the country through the controlled conservation of natural resources. In particular, emphasis will be given to the conservation and regulation of essential water supplies by the protection of catchments and the prevention of erosion through adequate measures of soil conservation.

It is also intended to preserve fauna and flora of unique scientific interest and to protect wild life generally, particularly game animals, as an asset of national importance in so far as such protection is compatible with other national development requirements.

DEVELOPMENT OBJECTIVE NO. 4

TRAINING

Adequate and comprehensive training facilities will be maintained to provide competent field officers capable of applying the results of scientific research consistent with the technical requirements of the Ministry.

As the ultimate success of agricultural policy depends upon the technical effectiveness of both field officers and farmers, training facilities and programmes for all types of farmer training will be expanded through the development of Farm Institutes and Local Training Centres. Special attention will be given to the in-service training of field staff. In recognition of the importance of youth as a major influence in agricultural development every effort will be made to mobilise the energy and enthusiasm of young people in support of improved farming practices and programmes conservation. Special attention will be directed to the training of youth in liaison with the Ministry of Education, the Malawi Young Pioneers and other youth organisations.

DEVELOPMENT OBJECTIVE NO. 5

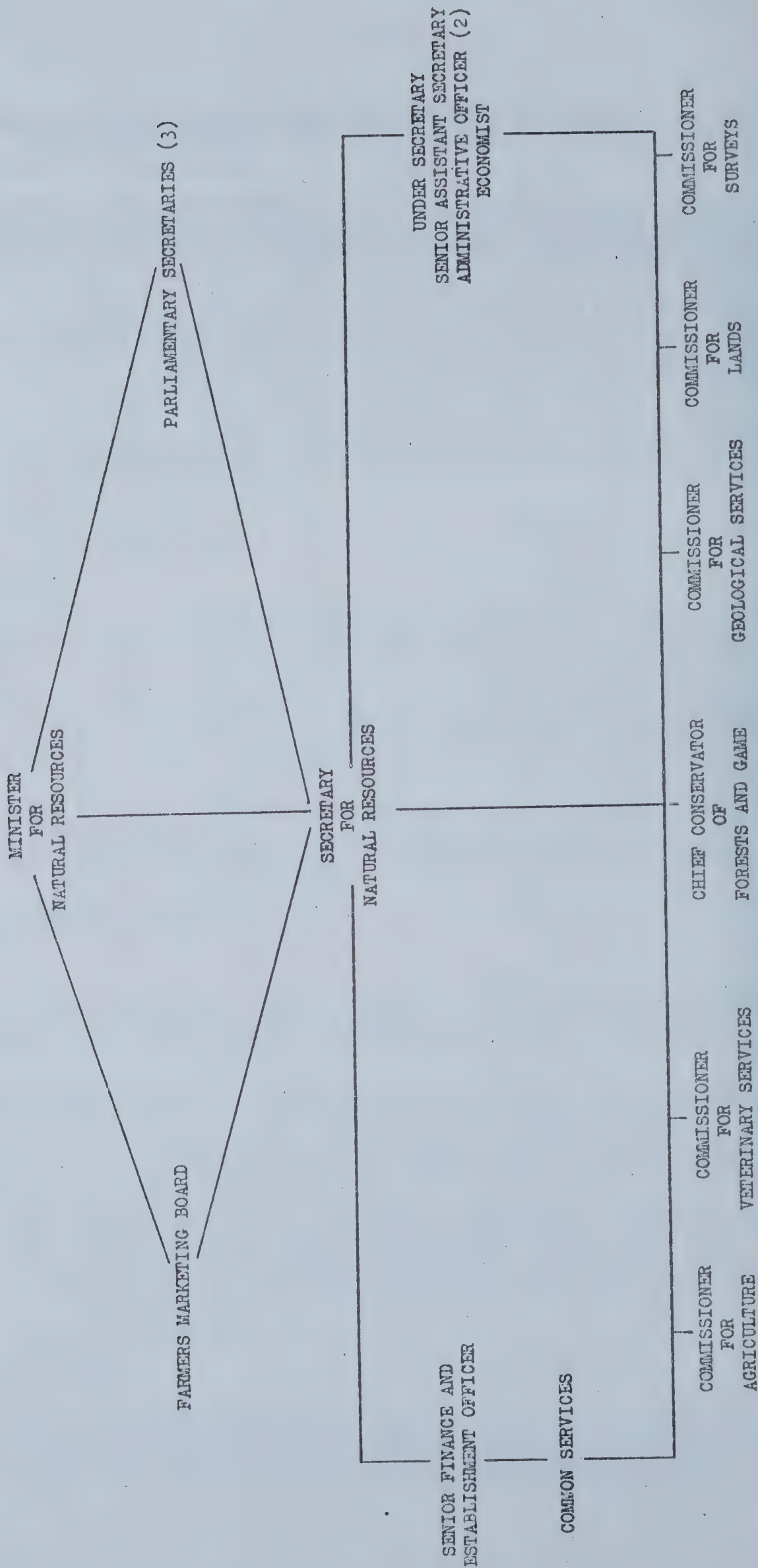
RURAL DEVELOPMENT

It is the intention to provide an effective mechanism for the co-ordination in rural areas of those activities which effect the expansion of the agricultural economy and to work towards the economic and social progress of agricultural communities. Particular attention is being given to developing popular

training programmes for women in better standards of nutrition, home management and the cultivation of those crops for which women are traditionally responsible.

The development objectives outlined above form the basis for departmental action under the administrative direction of the Secretary for Natural Resources supported by a Ministry Secretariat and the Heads of the six technical Departments as illustrated in the following organisational chart.

The Secretariat is responsible for the co-ordination of departmental activities particularly those of development planning, external aid, liaison with international organisations, the provision of a common service organisation and for routine administrative support.



	<u>SUPERSCALE</u>	<u>ADMIN.</u>	<u>SECRETARIAL</u>	<u>PROFESSIONAL</u>	<u>TECHNICAL</u>	<u>EXECUTIVE</u>	<u>CLERICAL</u>	<u>TECH. ASS.</u>	<u>SUBORD.</u>	<u>TOTAL</u>
MINISTRY	5	2	10	-	-	8	20	-	10	56
AGRICULTURE	16	-	5	35	90	4	84	614	340	1,187
FORESTRY AND GAME	5	-	-	11	37	-	38	86	164	341
VETERINARY	5	-	-	11	21	-	30	240	95	402
FISHERIES	1	-	-	5	6	-	6	42	8	68
GEOLOGICAL SURVEY	3	-	1	13	8	1	5	37	3	71
LANDS	2	-	3	3	-	3	8	-	4	23
SURVEYS	2	-	-	6	7	-	6	22	3	46
TOTAL	39	2	19	84	169	15	197	1,041	627	2,194

MINISTRY OF NATURAL RESOURCES

ESTABLISHMENT

The organisation and activities of Departments within the Ministry are summarised below :-

DEPARTMENT OF AGRICULTURE

In consideration of the importance of agricultural production to the development of Malawi, the Department of Agriculture is charged with the task of making a major contribution to national economic strength by guiding development towards the achievement of an efficient and prosperous farming community. In particular the Department is concerned with assuring the production of adequate food supplies to meet the demand of a growing population, and in encouraging the expansion of cash crop production to develop a cash economy having regard to world markets and approved national production policy.

The activities of the Department have the following objectives :-

1. To promote social and economic progress by improving the standard of cultivation from subsistence farming to economic farming; to promote better standards of living; to raise the level of farm family welfare and to encourage the acceptance of properly balanced programmes of rural development.
2. To encourage the wise use and management of land to promote a high level of sustained productivity through :-
 - (i) Farming methods designed to conserve the soil and improve its fertility
 - (ii) The proper planning of farms to develop their full potential and to diversify production in relation to soil qualities or other factors
 - (iii) By encouraging farmers to develop economically viable farming enterprises based upon properly planned systems of land use, farm layout and land allocation.
3. To increase the efficiency of farming operations through :-
 - (i) The use of improved varieties and better seed
 - (ii) The increased use of manure and artificial fertilizers
 - (iii) The control of pests, diseases and weeds
 - (iv) Improved methods of cultivation, harvesting, processing and storage
 - (v) The use of suitable farm equipment to meet the needs of more intensified operations
 - (vi) The better management and use of water to increase crop production.
4. To encourage and support the efficient production of cash crops under estate management.
5. To assist farming communities to expand agricultural production by providing advice on efficient farm management, the economic use of labour and farm equipment and instruction in simple business accounting methods.
6. To maintain adequate Research Services in support of the expanding programme of agricultural development.

7. To provide facilities for the training of farmers and their wives in improved farming methods, better standards of nutrition and family welfare and generally to educate the rural community to its responsibilities with regard to use and management of the land and the conservation of both soil and water resources.
8. To prepare annually a printed guide to agricultural crop production giving advice and targets for the following year.

ORGANISATION

The Department comprises two functional divisions under the overall control of the Commissioner for Agriculture, as follows :-

- (i) Research and Specialist Services headed by the Chief Agricultural Research Officer
- (ii) Extension and Training Services headed by the Chief Agricultural Extension Officer.

Matters relating to the co-ordination, integration and planning of agricultural development departmental projects are the responsibility of the Chief Agricultural Planning Officer.

Field activities are decentralised on a Regional basis. Field staff are organised under the direct control and supervision of Regional Agricultural Officers supported by a team of specialist officers stationed at Blantyre, Lilongwe and Mzuzu. Further decentralisation extends to district and area levels and is illustrated on the accompanying organisation chart.

Departmental field activities are carried out by a comprehensive extension service which administers a carefully compiled programme designed to stimulate the increased adoption of better farming methods and practices at village level. Activities of the extension service include :-

- (i) Devising local village crop production programmes with the full support and participation of the village people and compiling field extension programmes to meet with village requirements.
- (ii) Providing practical advice to farmers. In particular compiling simple farm plans and advising on the implementation of such plans as a means of establishing more productive and economic systems of management.
- (iii) Establishing method and result demonstrations to teach improved crop and animal husbandry throughout rural areas.
- (iv) Advising Farm Clubs and providing advanced training to progressive farmers and their families.
- (v) Assisting local leaders to play a more effective role in agricultural development.
- (vi) Making full use of mass media, including the radio, press and mobile units, to create further awareness and interest in improved farming methods.
- (vii) Developing suitable training programmes for women in recognition of their importance to the agricultural development of Malawi.
- (viii) Actively to engage in youth extension work as a means of mobilising the great potential of Malawi youth by associating them more closely with the development of agriculture.

The Department is also concerned with the basic training of staff at both pre-service and in-service level to ensure that field staff are fully competent to carry out their duties.

Farm Institutes and Local Training Centres cater for the training of farmers and their wives and provide an essential support to the extension organisation.

Further essential support to extension activities is provided by the Agricultural Research Services which operate through a country-wide network of field experiment stations and laboratories.

The major activities of the Research Division include the breeding and testing of improved varieties of approved crops; livestock improvement; investigations of crop rotations and cultural methods designed to increase soil fertility and productivity; soil analysis and surveys; and measures to control plant pests and diseases.

The programme of research and experiment is formulated and reviewed at regular intervals. It has the object of elucidating problems and devising agricultural improvements, which can be applied by the local farmers towards raising their standards of farming and increasing their returns from agriculture.

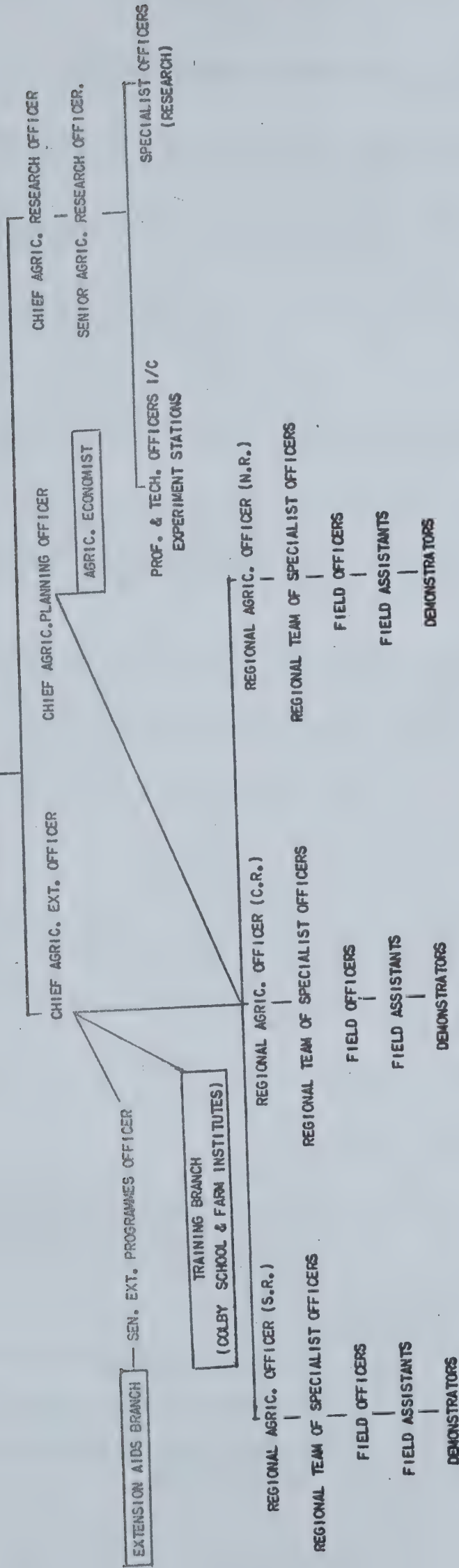
In addition the Department is closely associated and concerned with the activities of the Farmers Marketing Board and the Farmers Loans Board, details of which are given separately.

The establishment of the Department consists of :-

Professional Officers	52
Technical Officers	90
Technical Assistants	614
Subordinate Staff	330
Clerical Staff	84

and the organisation is illustrated by the chart which follows :-

COMMISSIONER FOR AGRICULTURE



THE FARMERS MARKETING BOARD

The Farmers Marketing Board is a statutory body set up under the Farmers Marketing Ordinance, as amended by Ordinance No. 30 of 1963, and is charged with responsibility for :-

- (a) The marketing, storage, processing or manufacturing, and disposal of agricultural produce grown on land other than that which is privately owned.
- (b) The provision and distribution of foodstuffs such as may be necessary from time to time.
- (c) The maintaining of adequate price stabilisation funds to :
 - (i) protect the producer from violent fluctuations in the world market, and
 - (ii) by means of price stability, the stability of production.
- (d) Providing at cost or subsidised prices, basic aids for the increased production of agricultural produce such as fertilizers, spraying equipment, insecticides, farm carts and other equipment required by farmers.
- (e) Making bursaries available for the study of agriculture or related sciences.

Marketing of crops was initially the responsibility of the separate Boards viz :-

African Tobacco Board

Cotton Marketing Board

Produce Marketing Board

which, in 1956, for reasons of economy in administration and operation and greater financial stability, were amalgamated into one organisation, the present structure of which reflects the policy of Government to maintain a close working association with primary producers. To this end producer representation is foremost in the composition of the Board which comprises :-

CHAIRMAN

A former General Manager who, whilst familiar with the operation of the Board, is an independant.

MEMBERS (i) UNOFFICIAL

- (11) One M.P. for each of the three Regions, viz. South, Central and North, seven members elected directly by producers through their Producer Liaison Committees, and one prominent commercial businessman.

(ii) OFFICIAL

- (4) The Secretary to the Treasury or his representative
The Under Secretary (Natural Resources)
The Secretary for Trade and Industry or his representative

The Commissioner for Agriculture or his representative.

The Board operates under the special and general directions of the Minister of Natural Resources with particular regard to policy and in respect of primary producer prices. It maintains a high degree of autonomy on financial matters being regarded as a commercial trading organisation which must be administratively flexible in its operation.

The financial reserves of the Board constitute its working capital and have been built up over a period of time through a policy of paying prices slightly below parity. Now that adequate reserves are established the Board pays the full export parity price on all crops purchased.

The crops handled by the Board are Tobacco, Cotton, Groundnuts and miscellaneous pulses together with small quantities of Wheat, Millet, Sorghum, Grain, Castor, Sesame, Sunflower and Barley for which the Board has an exclusive buying licence.

In addition the Board is the managing agent of the National Oil Industries on behalf of the Malawi Development Corporation. It owns and operates one cotton ginnery at Mitole and manages a seed production farm at Toleza for the purpose of building up supplies of high quality seed of approved varieties of cotton, tobacco and groundnuts.

The Board is administered from headquarters located in Limbe, with area offices at Limbe, Lilongwe and Mzuzu. Main storage and handling depots are maintained at Limbe, Lilongwe, Salima, Balaka, Mzuzu and Chiromo. In addition the Board maintains two permanent depots for seed cotton, one for Turkish tobacco and 40 major Tobacco markets (which also purchase groundnuts), 31 Cotton markets operated by Co-operative Societies on behalf of the Board. All markets are supported by numerous buying points located throughout the main crop producing areas to ensure the effective marketing of available produce.

The purchasing activities of the Board in regard to the three main export crops grown by African farmers is summarised below :-

YEAR	GROUNDNUTS SHORT TONS	SEED COTTON SHORT TONS	TOBACCO LBS
1960	20,600	12,500	20,290,000
1961	26,100	11,900	15,796,000
1962	36,250	19,050	22,571,000
1963	27,600	10,600	33,557,000
1964	19,500	14,850	18,356,351

The annual turnover of the Farmers Marketing Board is in the order of £5.5 million.

CENTRAL FARMERS LOANS BOARD

A Central Farmers Loans Board has been established for the purpose of assisting agricultural development with particular reference to the needs of small scale farmers in their transition from subsistence to economic agriculture.

The Central Farmers Loans Board operates in an advisory capacity to the Minister of Natural Resources and grants loans for the following purposes :-

- (1) Construction of farm buildings, roads, conservation works and water supplies required for efficient farm development.
- (2) Purchase of approved livestock.
- (3) Purchase of implements and farm equipment.
- (4) Purchase of fencing materials for paddocks and pastures.
- (5) Purchase of fishing boats, outboard engines and fishing gear.

Loans granted for any of the above purposes are limited in the following manner :-

- (a) No application for a loan of less than £20 will be considered by the Board.
- (b) The maximum amount which may normally be granted in the form of a loan will be £250.
- (c) Applications for loans in excess of £250 may be considered by the Board in special cases for recommendation to the Minister for his direction.

On applying for a loan, the individual farmer must satisfy the Board that he has a farm enterprise capable of benefitting by the investment of a loan, and that he has the experience and ability to make good use of the loan for achieving higher productivity, management efficiency or farm development.

Groups of farmers, such as a Farmers Club or Association or Producers Co-operative, must be recognised by the Board as a responsible organisation capable of efficiently using and repaying a loan through providing credit or services to members of the group on an individual or communal basis.

Interest is charged on all loans at a rate of 5%. The Board comprises one chairman, a deputy chairman, one selected farmer from each of the three regions and a prominent businessman, and will be supported by a series of District Loans Boards which will ultimately operate a strictly supervised programme of agricultural credit.

In its dealings with individual farmers, the Central Farmers Loans Board will only be concerned with medium or long term loans for specified purposes connected with capital development. Short term credit or annual crop loans to farmers will only be provided by the Central Farmers Loans Board through recognised and responsible farmers' organisations (such as Producer Co-operatives, Farmers Clubs, etc.) which will process this form of credit to their members and will be responsible for repayment to the Loans Board.

Until a team of Credit Supervisors has been trained and is in a position to take over the duties of reporting on loan applications, supervising the credit extended and providing an inspection service for the repayment of loans these services will be a function of the activities of the Department of Agriculture.

DEPARTMENT OF VETERINARY SERVICE, ANIMAL INDUSTRY AND FISHERIES

The primary responsibility of this Department lies in the control of endemic disease. Other development objectives include :-

- (i) Increasing Malawi's cattle population.
- (ii) Improving the quality and management of livestock.
- (iii) Assisting in the establishment of an effective and equitable marketing system for livestock products.
- (iv) The development of the fishing industry with particular regard to the improvement of fish processing, storage, handling, marketing and distribution, and the promotion of fisheries research.

The Department is administered by the Commissioner for Veterinary Services, who co-ordinates field activities on a Regional Basis through Regional Veterinary Officers stationed at Blantyre, Lilongwe and Kuzu. Field work is carried out by Veterinary Assistants in all cattle areas who maintain close contact with the village cattle owner. They are responsible for reporting outbreaks of disease and provide advice on all aspects of herd, poultry and pasture management.

DISEASE CONTROL

In its priority task of controlling disease the Department maintains a careful check on the number and distribution of cattle in Malawi and provides a comprehensive laboratory service for the identification of disease in ailing animals as well as for post-mortem examinations.

The main diseases of livestock are those spread by ticks, namely East Coast Fever, Redwater, Heartwater, and Gall sickness. Tick control facilities in the form of 140 dipping tanks have been constructed in the main cattle areas with more being built each year as funds, and trained staff to manage tanks, become available. Every effort is made to persuade cattle owners to dip their cattle at regular intervals. The efficiency of this method of control was demonstrated in 1963 when amongst 25,000 head of cattle in the Karonga Lake Shore area, and where over 80% of the cattle are regularly dipped, only 3 cases of tick-borne diseases were recorded; whereas in the 32,000 head of cattle in the S. Mzimba District, where less than 50% of the cattle are regularly dipped, 137 cases of tick-borne disease were reported. Dipping tanks are also used as focal points for disease control and animal management extension work. Arsenical dips are used because of their relative cheapness and ease of handling.

Preventative injections against Trypanosomiasis, Blackwater, Newcastle disease and Lumpy Skin disease are carried out in areas where these diseases occur.

Rabies in dogs, wild carnivore and livestock is widespread and the Department is closely concerned in the control of this disease. Vaccination is offered free and some 50,000 dogs were vaccinated during 1964, stray dogs are shot. Rabies vaccination is done by all officers in the Department and is available at all dipping tanks. Two Rabies Control Officers with ancillary staff are employed, one in the Southern Region and one in the Central Region; these officers operate in heavily infected areas and help to augment the district staff.

Major endemic diseases such as Foot and Mouth Disease infect Malawi cattle from time to time which necessitate comprehensive campaigns to achieve full control, in particular the regulation of the movement of cattle from infected areas. It should be noted that other countries will not import agricultural products from areas in which foot and mouth disease exists unless the disease is known to be under control.

A further function of the Veterinary Department is to ensure that infected cattle from neighbouring territories do not enter Malawi and to regulate the movement of cattle within the country. A permit system is operated and a quarantine station is maintained for newly imported animals and for animals moving from the East Coast Fever areas of the Central Region to the Southern Region.

A central laboratory is maintained at Blantyre where diseases are identified, vaccines and medicines are distributed and investigations are made into unusual outbreaks of disease and into the efficiency of vaccines and drugs. In addition, district laboratories are available at each centre where routine disease identification and dip testing are carried out under the direction of the Regional Officer.

The control of disease has resulted in a significant increase of the cattle population. In the 10 years 1954 - 1964 the cattle population has risen from 292,000 to 411,000.

A further service is the provision of advice to cattle owners in general herd management, the culling of unsuitable stock, the management of grazing and the marketing of stock.

Control of grazing is important as in many parts of the country cattle are grazed in wet marshy areas which lead to intensive parasitism with liverfluke and other diseases.

Because of the danger from predators cattle must be secured at night and the provision of adequate accommodation for cattle is a vital necessity. For a number of years the Veterinary Department has provided financial assistance to cattle owners who have been willing to construct suitable shelters. Calf mortality is extensively reduced by the provision of good sleeping quarters.

LIVESTOCK IMPROVEMENT

In an attempt to improve the quality of beef meat carcasses attention is being given to the introduction of artificial insemination techniques to achieve a more rapid genetical improvement in the indigenous cattle than is possible through selective breeding techniques. Deep frozen semen will be imported and distributed throughout the country on a carefully controlled basis. At the same time cattle owners will be encouraged to adopt better standards of management for improved livestock as a means of increasing the production of high grade beef.

FISHERIES DIVISION

The potential sustained maximum production of the territory has been estimated at 26,000 tons per annum. It is possible to collect accurate figures for actual tonnage of fish caught but this is estimated at a round 12,000 to 14,000 tons per year. About a quarter of this amount is produced by commercial concerns from which about 500 to 1,000 tons are exported to neighbouring territories. This export has considerably improved the opportunities on the home market for the small producers.

There are at present three commercial fishing firms and numerous smaller fishermen operating as individuals or small groups engaged in full time fishing on the waters of Lake Nyasa, Lake Malombe and Lake Chilwa. It is the Government's policy to encourage commercial fishing, which requires expensive equipment, in the off-shore areas of the Lake and to reserve the more easily exploited on-shore fishing grounds and shallow waters for the small scale fisherman. Attention is also being paid to inland fish-farming in ponds and dams in areas where the supply of lake fish is unreliable.

Fisheries advisory activities are primarily directed to establishing accurate estimates of the fisheries production of the various lakes with the object of ascertaining satisfactory levels of off-take and determining if the future of any particular area is being prejudiced by over-fishing. A professional officer with a staff of technical officers and assistants are engaged in supervising and recording catches and in advising fishermen on improved methods and equipment.

Under their guidance a number of small craft equipped with outboard engines have come into use over recent years. A mobile maintenance unit is run to provide satisfactory service for these engines.

POULTRY

The Poultry Unit is situated at Mikolongwe in the Southern Region where Black Australorps are bred and distributed at 6 weeks old to those members of the community who are interested in poultry raising, approximately 50,000 birds are distributed annually. Every effort is being made to expand the poultry industry and improve the methods of husbandry with the objective of increasing supplies of animal protein at village level.

MARKETING

The creation of the Cold Storage Company with cold storage facilities and a modern abattoir at Blantyre has provided a suitable market for cattle. Until recently cattle have been brought to Blantyre by dealers and sold at the Blantyre saleyard where they have been bought by local butchers at an auction sale, the starting price being determined by weight and grade. The Cold Storage Company is the residual buyer as well as purchasing in direct competition with the butchers. Suitable breeding animals are bought by the Veterinary Department, held at Mpemba and resold to farmers. During 1964 three more markets were established, at Zomba, Lilongwe and Mponela, to permit the cattle owner to sell direct rather than through a dealer. The construction of a further 13 markets is proposed in 1965.

The primary marketing of hides and skins is the responsibility of the Veterinary Department. Veterinary Assistants in the field purchase hides and skins which they then process at hide sheds provided at most dipping tanks. The hides and skins are graded and stored at the dipping tanks and sent in bulk to the Cold Storage Company at Blantyre where the grading is checked and they are prepared for export. In 1963 the value of hides and skins exported was £44,000 which represents 80% of the hides of all cattle and sheep slaughtered during 1963.

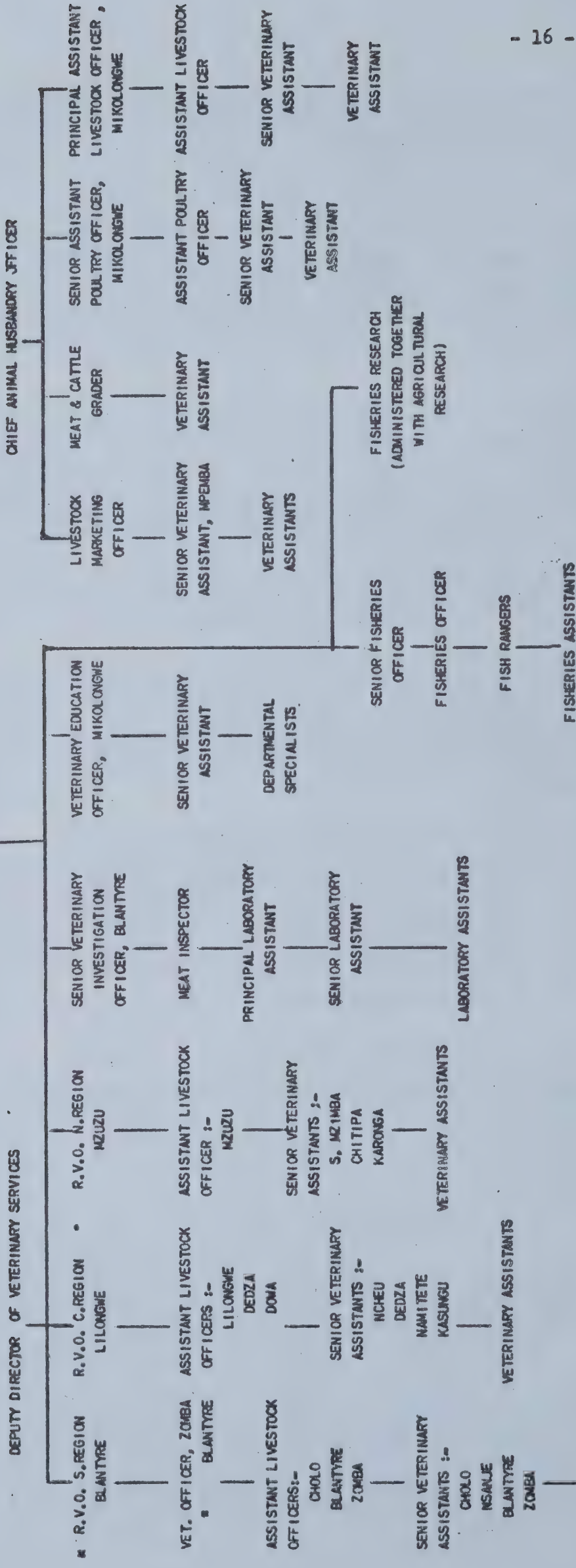
The establishment of the Department consists of :-

Professional Officers	23
Technical Officers	27
Technical Assistants	282
Subordinate Staff	103
Clerical Staff	36

and the organisation is illustrated by the chart which follows :-

COMMISSIONER FOR VETERINARY SERVICES

DEPUTY DIRECTOR OF VETERINARY SERVICES



VETERINARY ASSISTANTS

REGIONAL VETERINARY OFFICER

DEPARTMENT OF FORESTRY AND GAME

The forests of Malawi are a valuable national asset. They play an important role in the expansion of the economy not only through the production of high quality wood products but as the guardian of essential water supplies upon which agricultural stability is dependent.

The forest estate is administered by the Department of Forestry and Game which is charged with the responsibility of :-

- (i) Managing the nation's forests in such a way as to conserve and improve essential water supplies through the protection of water catchment areas; maintain the climatic conditions of the country; prevent soil erosion; preserve and maintain areas of scientific importance and provide facilities for recreation.
- (ii) Developing the forest resource to provide sufficient quantities of forest produce to meet the internal requirements of Malawi as well as providing a surplus of those products for which export markets are available.
- (iii) Ensuring the protection of game and wild life and developing the facilities of the Malawi National Park and of Game Reserves as tourist attractions in close co-operation with the Ministry of Trade and Industry.
- (iv) Encouraging the establishment of productive forests and wood lots by private organisations, individuals or Local Authorities to provide supplies of forest produce for local, as opposed to national consumption.

The Operations Conservancy is responsible for the administration of all field work. This comprises :-

- (i) The establishment and management of tree plantations to meet projected local requirements of wood products as well as to provide specialised products, such as wood pulp, for export. The efficient management of commercial tree plantations is one of the most important tasks of the Department which has established a total of 36,097 acres of plantations by mid 1964. These comprised 30,911 acres of conifers, 2,072 acres of hardwoods and 3,114 acres of experimental species. A further 1,432 acres of plantations had been successfully planted on behalf of District Councils to give a total area under Departmental management of 37,520 acres. The annual planting programme for the production of timber is designed to provide 1,500 acres of new plantations per annum. Of the exotic conifers the most extensively planted species is Pinus patula; secondary species being Pinus elliottii and Cupressus lindleyi. Of the exotic hardwoods preference is given to the planting of Eucalyptus species and to Gmelina arborea. Constant attention is being given to the possible introduction of new species.

An important project being undertaken by the Operations Conservancy is the projected establishment of 90,000 acres of Pine plantations on the Vipya Plateau to create the raw material for a Paper Pulp Industry. This scheme is a high priority development project and planting is progressing at the rate of 7,000 acres per annum.
- (ii) The protection of important watershed areas including the protection of wild life within the forest reserves as well as the management and protection of wild life within game reserves.
- (iii) The management of indigenous woodland within the forest reserves.

- (iv) The management of forests on behalf of District Councils and the encouragement of tree planting by private individuals.
- (v) The operation of three departmental sawmills to utilise the output from softwood timber plantations and to administer the sale of produce generally from all forest reserves.
- (vi) The development of tourist facilities in game reserves and in the Malawi National Park and the provision of recreational facilities in forest reserves.
- (vii) The control of hunting through the issue of permits to shoot game and wild birds and through the licensing of game trophies.
- (viii) The control and development of trout fishing.
- (ix) The development of an advisory service on bee keeping.

The Management Conservancy provides the principal specialist services required by the Operations Conservancy including Research, Training, Mapping, Mensuration, Planning and Utilisation. Details of these services are given below :-

- (i) Research is largely related to the exotic softwood plantation programme and includes species and growth trials, investigations into the methods of plantation weeding, pruning and thinning, tree breeding and nursery work. Attention is also given to the silvicultural improvement of indigenous woodland.
- (ii) The Malawi Forest School provides facilities for training up to Technical Assistant level on the basis of a two year course which emphasises the practical aspect of forest management and provides for in-service training of staff.
- (iii) The detailed long term planning and control of forest operations is an important aspect of the Management Conservancy and is supported by the co-ordination of forest survey work, the final preparation of field maps and the administration of a comprehensive map library. A special responsibility is that of detailed forward planning for the Vipya Pulpwood project.
- (iv) The conservancy is responsible for the operation of the Departmental sawmill in Blantyre which includes a pressure impregnation plant, box shooks plant, and forced draught kilns. It also converts and seasons indigenous hardwood timber for furniture construction.

The Forest Utilisation Branch provides an advisory maintenance and saw sharpening service for other departmental sawmills and undertakes special investigations and research into utilisation problems.

The Costings and Records Section is a function of headquarters control and is charged with the recording, costing and analysing of all departmental operations and with obtaining all equipment, materials and tools. This section also provides assistance to the Operations Conservancy on principal development projects.

The establishment of the Department, totalling 341 is made up as follows :-

Professional Officers	16
Technical Officers	37
Technical Assistants	86
Clerical Staff	38
Subordinate Staff	164

In addition the Department employs a permanent labour force of 3,000. Departmental organisation is illustrated by the chart which follows :-

CHIEF CONSERVATOR OF FORESTS

CONSERVATOR OF FORESTS (OPERATIONS)

CONSERVATOR OF FORESTS (COSTING/RECORDS)

CONSERVATOR OF FORESTS (MANAGEMENT)

ASSISTANT CONSERVATOR OF FORESTS

(SOUTHERN REGION)

ASSISTANT CONSERVATOR OF FORESTS

(CENTRAL REGION)

ASSISTANT CONSERVATOR OF FORESTS

(NORTHERN REGION)

ASSISTANT CONSERVATOR OF FORESTS (MANAGEMENT)

(1 FORESTER)

BEEKEEPING OFFICER
(ALL REGIONS)

ASSISTANT CONSERVATOR OF FORESTS

(SPECIAL DUTIES)

PRINCIPAL FORESTER, ZOMBA

(2 FORESTERS)

(1 WORKS SUPERVISOR)

(1 MILL FOREMAN)

FORESTER, CHOLO/MLANJE

(1 FORESTER)

FORESTER, CHIGUMULA

FORESTER, NOIRANDÉ

FORESTER, MALIKA

GAME RANGER

PRINCIPAL FORESTER, DEDZA

(2 FORESTERS)

FORESTER, BUNDA

GAME RANGER

ASSISTANT CONSERVATOR OF FORESTS

(SPECIAL DUTIES)

PRINCIPAL FORESTER

CHIKANGAMA

(3 FORESTERS)

FORESTER, LUSANGADZI

FORESTER, NYIKA

GAME RANGER

SENIOR ASSISTANT CONSERVATOR OF FORESTS

CHONGONI

INSTRUCTOR, FOREST SCHOOL

(ASSISTANT INSTRUCTOR)

SILVICULTURIST

(1 FORESTER)

MILL MANAGER (F.U.B.)

MILL FOREMAN

SAWDOCTOR

WORKS SUPERVISOR

DEPARTMENT OF GEOLOGICAL SURVEY

The function of this Department is to survey the country geologically and to publish the results in a series of maps and reports; to carry out investigations of occurrences, groundwater resources and subsurface conditions generally and provide advice to Government and other concerns interested in the development of mineral and water resources, in the utilisation of earth materials and in the application of geological data to engineering projects.

A thorough knowledge of the geological environment is essential if the economic potential of an area is to be assessed reliably and at the present time almost two thirds of Malawi has not been adequately explored. The long-term aim of the Department is to complete systematic regional geological mapping for publication at a scale of 1:100,000 but in view of the urgency to obtain a preliminary overall concept of the country's mineral potential, a short-term reconnaissance survey is being undertaken within the framework of the present Development Plan to complete the examination of the country in detail suitable for publication at 1:250,000 or better.

Geochemical techniques are now being used to narrow the field of search for economic mineralization. Drainage sediments are collected at half mile intervals in all streams and damboes in areas where reconnaissance geological mapping takes place and these are analysed spectographically and by other analytical processes; several hundreds of determinations are made every week in the Geological Survey laboratories. It is hoped that certain elements, if proved to be present in anomalous amounts in surface drainage, may indicate the existence of concealed concentrations of economic minerals.

Once the geological environment of a region is well understood it is possible to select areas which appear favourable for mineral discoveries. Geological and geochemical investigations are then carried out in increasing detail over such areas, supported where warranted by geophysical investigations. If these results are encouraging, pitting, trenching or shallow diamond drilling may be undertaken and, providing results continue to be encouraging, the drilling programme is intensified in order to define the limits of mineralization. Progressively through each stage of the investigation samples are examined to determine their content of ore mineral. This information together with that obtained from geological study, mapping and other activities enables the extent, continuity, depth and grade of any mineralization to be determined.

The value of any mineral deposit is further dependent upon the changing demands of local and world markets and also upon such factors as transport facilities, labour and power supplies. Reassessment is required as the relationship of these factors change and in a rapidly developing country such as Malawi there is a continuing need for reappraisal.

The present Development Plan provides staff and equipment which enables the Geological Survey Department to discharge its function at an accelerated rate. An area of over 5,000 square miles was covered by geological survey and geochemical reconnaissance in 1964 and it is hoped to improve on this rate of survey in forthcoming years as work proceeds northwards.

Mineral deposits currently being examined include pyrite which could be useful for the local manufacture of the sulphuric acid necessary for the pulpwood project, limestones which could be utilised for the same project, and deposits of apatite on which a fertilizer industry could be established. The examination of deposits of monazite and strontianite has been proceeding for some years and these have now been proved to have an economic promise. A full survey of the economics of establishing an alumina industry on the basis of proved deposits of bauxite is about to be undertaken and there are many other mineral deposits discovered by the Geological Survey which could become of value in future years as Malawi develops. Groundwater resources which are being assessed by the Geological Survey are being developed by

the Ministry of Works to improve the life and comfort of the people and aid in the production of increased quantities of agricultural produce.

The Department is administered by the Commissioner for Geological Survey and has a professional and technical establishment of :-

Senior Geologist and Geologists	12
Petrologist/Mineralogist	1
Chemist/Assayer	1
Chemist/Spectrographer	1
Senior Prospector and Prospectors	5
Senior Cartographer and Cartographers	3

These are supported by an establishment of :-

Executive Officer	1
Secretarial Officer	1
Clerical Officers	5
Technical Assistants	37
Subordinate Class	3
Industrial Class	93

A temporary labour force is recruited as and when it is needed.

SECTION B

DEVELOPMENT PROJECTS

MINISTRY OF NATURAL RESOURCES

SECTION B

DEVELOPMENT PROJECTS

INTRODUCTION

This section describes the various projects included in the Ministry's 1965-69 Development Programme listed by subjects under the Departments responsible for their planning, implementation and direction. The schemes falling under the Department of Agriculture, which form by far the largest proportion of the total, are sub-divided into general schemes, training schemes and crop production schemes.

Finance for the projects in the form of grants or loans will, it is expected, be provided mainly by the British Government; if finance has been obtained from other sources this has been noted in the text.

In addition to the development projects described in the following pages, from 1966 onwards new projects will be included in the programme to provide for salaries and allowances of agricultural and veterinary staff engaged on development work. This is already the case in respect of Forestry and Geological Survey projects where provision for staff is included in the projects themselves.

DEPARTMENT OF AGRICULTURE

GENERAL SCHEMES

PHYTOSANITARY INSPECTION SERVICES

This scheme caters for the construction of three houses for phytosanitary inspectors in Lilongwe, Limbe and Balaka. The duties of these technicians are to inspect produce prior to export and to examine premises used for storing produce with a view to recommending anti-pest measures. This inspection service is designed to maintain the present high standards of quality in Malawi's export crops. The construction of the houses should be completed by the end of 1965.

Projected expenditure 1965 £7,650.

OX DAM BUILDING UNITS

The shortage of water available for human and livestock purposes hinders or prevents settlement and cultivation over large areas of the Northern Region. This scheme is to provide for the construction of small earth dams by ox team dam building units. In addition to making water available for human and animal purposes dam walls can often be used to provide satisfactory all weather road crossings across streams, a considerable advantage in a countryside which is dissected by numerous drainage lines which cannot be crossed by wheeled traffic during the wet season without the provision of causeways or bridges.

The Scheme provides for the continued operation of twelve units, each consisting of 26 oxen (two teams of 12 with 2 oxen in reserve). Oxen are usually harnessed in pairs so that each team represents six dam-scoops, one team working in the morning and one in the afternoon. Preliminary site clearance work is carried out by local villagers on a self help basis. The project is financed by the Kensington, England, Freedom from Hunger Campaign Committee.

Expenditure prior to 1965	£8,889
1965	£9,000
1966	£8,211

INCREASED USAGE OF FERTILIZER AND IMPROVED SEED

This scheme is divided into five projects - publicity to encourage fertilizer sales, replacement of station produced seed maize and groundnuts, production of Turkish tobacco seed, vegetable seed production, and potato variety multiplication and deciduous fruit type propagation.

The fertilizer publicity campaign is aimed to accelerate and increase sales of subsidised fertilizer made available to farmers by the Farmers' Marketing Board with financial and material assistance from the Federal Republic of Germany. The project embraces the purchase of printing equipment and provides for purchase of paper, blocks and artwork, operation of 4 mobile units, press and radio advertising, bulletin boards, puppet operators and audio-visual equipment. The success of the fertilizer sales campaign should result in greatly increased yields of food and cash crops with substantial benefit to the agricultural economy.

At present a quantity of maize and groundnuts of improved seed varieties grown on agricultural stations is used for labour and livestock feeding. Distribution of these improved strains of seed to farmers could result in potential increased yields of the crops concerned, and the project aims at the replacement of this distributed seed by purchase of commercial stocks.

The scheme for Turkish tobacco development is described later in this section. A small amount of expenditure is being provided under this item for the production of Turkish tobacco seed required for the expanded acreage.

A profitable avenue of production is available to cultivators who supply townships in Malawi with vegetables. In order that production may be developed along planned lines, the extension service maintains demonstration gardens and bulks up vegetable seed for sale to vegetable growers. Development of these services will be followed throughout the period of the current development plan.

The final project under this item involves the breeding of improved potato varieties in the Dedza District of the Central Region and the propagation of deciduous fruit trees at Mwera Hill, also in the Central Region.

Other projects for increased seed production, particularly of improved maize and groundnut varieties, are anticipated during the period of the five year plan.

Projected Expenditure	1965	£ 10,100
	1966	£ 7,600
	1967-69	£182,300
		<hr/>
		£200,000
		<hr/>

FARM DEVELOPMENT

This item covers eleven projects - tractor contract ploughing, ox training, fish pond farming, coffee development, supervised credit support, land planning in the Central Region, farm machinery repair service, Ninde oil, completion of the demonstration unit at the Likuni Farm Institute, provision of development transport, and subsidies for soil conservation works.

The object of the first item is to provide a tractor ploughing service primarily for cotton growers in the Lower Shire Valley. A long dry season, contiguous cotton gardens, well cleared land and a demand from growers provide favourable conditions for a project of this nature, which should produce improved crop yields, and a stimulus to rearrange garden boundaries to suit tractor work, which will in due course facilitate cotton spraying. It is proposed to purchase 5 tractors and ploughs, 6 uniport rondavels (of which 2 will be used as stores), 10 tents for tractor drivers and a land rover workshop, and to provide for the fixed and operating costs for the unit. Each tractor should be able to complete 1,500 hours work in a 6 month season and to plough 650 acres.

The purpose of the second scheme is to extend the present ox training schemes by providing sets of trainers operating in the Southern and Central Regions. Oxen will be trained on the farmers' own land but with provision for farmers from surrounding areas who would be accommodated in movable aluminium houses. In the Northern Region ox training will be undertaken in conjunction with the ox-dam construction unit. The widespread use of trained oxen will result in a reduction of labour requirements for cultivation, increase the overall efficiency of cultivation methods, and augment yields. In the Central Region, following the success of a pilot project in 1964, demonstrators with three units each, consisting of a pair of oxen and implements will be put into a village, at the villagers' request, for a period of two or three years. The individual holdings will be rearranged in strips to facilitate ox cultivation and a basic conservation layout will be incorporated. This is the first step to full land reorganisation. Apart from the benefits to cultivation already mentioned, the effects of the land reorganisation should result in approximately a further 10% of land coming into use and it is anticipated that any village communities requesting changes of this nature, will be found willing to adopt other methods of better crop husbandry including the use of fertilizer and improved seed.

Although fish pond production is not recognised as providing a complete and economical answer to the overall shortage of animal protein, it can form a useful addition to protein nutritional requirements. There are already 450 fish ponds in the Northern Region and the proposals aim at providing staff for increasing the efficiency of future fish pond construction and site selection, as well as a better extension service.

There are at present in the Northern Region between 1,500 and 2,000 acres of coffee. Shortage of efficient pulperies is considered to be a factor limiting the maximum exploitation of production from this acreage. It is proposed in the first year of the project to build four pulperies at places where there is a concentration of established coffee. In addition experimental and demonstration plots are to be developed and the mobility of extension staff is to be improved. In addition to this work in the Northern Region, experimental and nursery work is to be continued in the Central Region.

Three credit supervisors to assist in the administration of rural credit schemes return to Malawi in 1965 after a period of overseas training. This project involves provision of motor cycles and running expenses for them and 11 other credit supervisors due to be trained over the next 4 years and for supporting subordinate staff, to enable them to carry out their duties.

Several adjacent villages covering approximately 30 square miles in the Central Region have requested a conservation scheme, and this section of the project caters for the surveying and laying out of the area in a complete land reorganisation framework. The project involves 3 teams in 1965 increasing to 11 in 1969, comprising from 21 to 77 conservation assistants and 18 to 66 supporting staff, as well as portable housing and stores. Six Graders and ancillary machinery and transport will also be provided. The target area to be planned by 1969 is 124,000 acres, and apart from increased yields resulting from a general improvement in farming methods, the increase in productive land resulting from the land reorganisation should be approximately 12,400 acres.

The farm machinery repair service is being set up on a quasi-commercial basis to repair ploughs, ridgers, carts and sprayers that have been introduced into rural areas in increasing numbers over the past few years. It is hoped that eventually the service may be taken over by a non-Government organisation.

Experiments with the essential oil crop, Ninde, have been carried out in Mbawa in the Northern Region, but further progress on a wider scale is dependent on the purchase of a still capable of producing commercial quantities of oil. Provision is included for purchase of such a still.

The item for the Likuni Farm Institute will be used to complete the demonstration farm unit, an essential adjunct to any farmer teaching centre of this nature. This will provide, in an environment with which farmers are familiar, a working farm embracing all concepts of good crop and animal husbandry.

The project for transport will provide for the purchase of four Land Rovers in 1965 and for their subsequent maintenance and running expenses over the remainder of the development plan period. This transport will be used by personnel directing development projects, the success of which is dependent on close supervision.

Under a new scheme payments of subsidies are made for dams, weirs and soil conservation work carried out by farmers. The object is to encourage soil and water conservation in the national interest.

Projected Expenditure	1965	£ 59,922
	1966	£ 71,016
	1967	£ 55,439
	1968	£ 90,710
	1969	£ 58,744
		<hr/>
		£335,831

DAM CONSTRUCTION

This scheme is related to that for Turkish tobacco development. The Ministry of Natural Resources is responsible for the selection of dam sites in the areas of Turkish tobacco development in the Kasungu District of the Central Region where development of the crop is limited by lack of available water supplies. Construction is to be undertaken by contract under the supervision of the Ministry of Works. The average dam size is 20 - 30 million gallons and it is contemplated that from 7 to 10 will be built in 1965. The first stage of the programme calls for 20 such dams.

The total cost of the project will be £485,000, but until the exact contract prices for construction are known, it is not possible to phase the project on an annual basis.

AGRICULTURAL RESEARCH

Agricultural Research in Malawi is conducted on a strictly practical basis to find ways and means of producing larger crops of better quality.

There are three principal Research Stations the largest of which is at Chitedze in the Central Region. Work at Chitedze is undertaken by research staff working in teams on a number of subjects.

- (1) The Chemistry section undertakes experiments on fertility problems of the soil including, in addition, plant analysis.
- (2) The Plant Breeder's main activity is improving the maize yield and recent work was begun on tobacco with a view to producing strains of tobacco resistant to the main diseases.
- (3) The Tobacco section does experimental work on cultural methods and is also responsible for the production of seed for the whole country.
- (4) The Agronomist undertakes work on the production of maize, groundnuts and other crops and is responsible for investigations into possible new cash crops.
- (5) The Animal Husbandry Officer is engaged on a programme to improve the indigenous breed of cattle by producing a type of animal with greater productivity.

- (6) The Plant Pathologist is engaged in a study of diseases, principally those of tobacco.
- (7) The Pasture Officer undertakes work on the improvement and management of pastures.

Bvumbwe Station in the Southern Region, is responsible for studies concerned with the culture of Tung and Coffee. As well as general agronomic experiments on coffee, work is in progress to breed a variety resistant to *Fusarium stilboides* the most serious disease of this crop. Work is also being undertaken on crops suitable for the small farmer in this ecological zone. The Entomologist, also stationed at Bvumbwe, is responsible for the identification and control of insect pest including the phytosanitary control of agricultural exports.

At Makanga Station in the Lower Shire, experimental work is undertaken on cotton, sugar and other irrigated crops including cocoa. Breeding work on cotton is the principal activity as it is necessary to ensure an improved seed supply to growers. Work on sugar consists of a range of agronomic experiments as well as variety testing.

The purpose of the development provision is to provide equipment, buildings, staff and other support for the various projects being carried out on the stations. While the basis for increased crop production must rest primarily on improved methods of husbandry, in the longer term agricultural research services must play an essential role in augmenting the overall productivity of the agricultural sector of the economy.

Projected Expenditure	1965	£ 36,000
	1966	£ 28,470
	1967	£ 34,795
	1968	£ 30,055
	1969	£ 25,765
	Unphased	£ 69,915
		<hr/>
		£225,000
		<hr/>

EXTENSION AIDS

Many development schemes and projects now being implemented and which aim at raising agricultural productivity, necessitate increased and more effective extension activity by field staff of the Department of Agriculture. Arising from this increased activity, there is a rapidly growing demand for teaching material to supplement, clarify and reinforce field extension activities. In addition, as extension staff can only contact directly a small proportion of the total rural population with advice and guidance on farming problems, increased use must be made of modern methods of mass communication. This is particularly important as the most practical and rapid way of increasing the production of food and economic crops is to persuade the mass of farmers to adopt a number of simple, improved farm practices which will result in higher yields and quality of crops. The capacity of the Extension Aids Branch is now being expanded to cope with vastly increased demands for extension teaching materials and equipment for use at Farm Institutes, Training Centres, Farm Clubs and in the field as well as for the mounting of major publicity campaigns to inform and educate the public in better farming methods and the conservation and wise use of Malawi's Natural Resources.

The capacity of the Extension Aids Branch to produce mass communication material will be expanded as follows :-

(a) PUBLICATIONS

Expand facilities to establish self-contained small reprographic unit, producing :

Technical Bulletins and Service Reports

Extension literature, including leaflets, charts, posters etc.

Farm News magazine

Staff and farmer training texts.

(b) EXHIBITS

Acquire portable display equipment for construction of educational exhibits at agricultural shows, demonstrations and meetings, schools and training centres.

(c) MOBILE CAMPAIGN UNITS

Provide replacement vehicles and re-equip with improved facilities, in particular, high-powered projectors for projecting instructional slides and filmstrips to large audiences.

(d) RADIO

Provide tape-recorders and studio equipment to facilitate production of farm radio programmes.

(e) FILMS

Provide additional cine apparatus to produce short publicity films for use on units on campaign work.

In addition, audio-visual equipment and materials will be provided for use at Regional and local centres and in the fields as follows :-

SILK SCREEN EQUIPMENT for production of posters and charts.

PHOTOGRAPHIC AND PROJECTION EQUIPMENT AND MATERIALS to produce teaching aids for use at Farm Institutes, training centres etc.

BULLETIN BOARDS for permanent demonstrations and Farm Clubs.

The economic benefits deriving from increased use of modern mass communication methods and equipment and of audio-visual aids may not be immediately apparent or directly attributable to such publicity. The reason is that the purpose of using such aids is to multiply the ability of the very scarce resources of trained and experienced technicians, trainers and extension workers to provide advice and guidance to large numbers of rural people. In addition, the use of audio-visual aids speeds up the adoption of improved methods of farming by improving teaching effectiveness through use of materials which help the farmer or student to learn rapidly and thoroughly. Thus the work of the Extension Aids Branch is an integral part of the total educational effort of the Ministry. Therefore, it is difficult to evaluate publicity and audio-visual aids separately as their effect is to accelerate the attainment of development targets by creating awareness and understanding of the objectives and programmes of the field organisation.

Projected Expenditure	1965	£25,200
	1966	£16,590
	1967	£17,235
	1968	£17,460
	1969	£ 9,095
		<hr/>
		£85,580
		<hr/>

TRAINING SCHEMES

BUNDA COLLEGE OF AGRICULTURE AND BUNDA FARM

This College, sited at Bunda 18 miles South West of Lilongwe in the Central Region, is being designed to provide complete facilities for the training of students over a period of three years for a full Diploma in Agriculture. The College will accommodate 180 students, with its first intake of 60 students taking place in June, 1966. The College is supported by a farm of 970 acres, development of which also falls under the overall development programme.

Construction of the College is phased. Phase I, which has already been commenced, includes 4 dormitories, a laboratory/classroom block, a classroom block, dining and kitchen block, stores and generator houses and staff quarters. Phase II will embrace construction of an assembly hall, 8 further dormitory blocks, 3 more classroom blocks, 1 additional laboratory, a staff block, a teaching workshop, a library, a sick bay and the balance of staff quarters required. Financing of construction is a joint venture between the Government of Malawi and the United States Agency for International Development. Assistance in staffing the College is being received from the University of Massachusetts and from the United Nations.

The establishment of the College is regarded as a major project within the overall framework of the development plan since any increase in agricultural productivity will be largely dependant on the calibre of the members of the Extension Service. The teaching at the College will be designed to produce a cadre of highly trained extension workers completely familiar with all aspects of agriculture as practised in Malawi. The College is being developed in close association with the University of Malawi and with its educational policies.

Projected Expenditure	1965	£110,000
	1966	£220,000
	1967	£ 59,905
		<hr/>
		£389,905
		<hr/>

FARM INSTITUTES

The object of the Farm Institutes in Malawi, of which there are three, one in each Region, is to provide adequate facilities for the practical training of farmers and farm families throughout rural areas. The farm institutes are major centres of extension development and provide a stimulus to local leaders and progressive farmers who are in a position to influence local practices.

Courses at the farm institutes are designed to cater for the needs of established farmers and their wives, and of local leaders by providing short courses, while three month courses for single young men (who have completed six years of educational instruction in English) cater for those who wish to become farmers. In addition, each Farm Institute is the focal point of rural development training in all aspects of conservation education, agricultural credit and other subjects. Home Management units are planned to be attached to each institute. The basic components of the farm institutes are a classroom/administration block, semi-detached quarters for students, a creche, a dining room/kitchen/recreation block, staff housing and workshop accommodation. Each institute has unit farms of various sizes attached, and these afford demonstrations under field conditions.

The potential for increased production of crops through improved farming methods is considered to be more than double the present level of productivity. The present type of peasant subsistence level farming continues to lag behind accepted modern agricultural standards and therefore the provision of teaching facilities in agriculture at farm institutes for the rural community should make a significant contribution to increasing the overall output of food and cash crops in Malawi.

Expenditure

<u>Likuni Farm Institute</u>	Prior to 1965	<u>£46,417</u>
	1965	£ 3,500
	1966	£ 9,207
	1967	£ 1,050
	1968	£ 1,074
	1969	£ 1,218
Total Development Plan period		<u>£16,049</u>
<u>M'mbelwa Farm Institute</u>	Prior to 1965	<u>£40,623</u>
	1965	£ 5,730
	1966	£12,050
	1967	£ 1,026
	1968	£ 1,050
	1969	£ 1,254
Total Development Plan period		<u>£21,110</u>
<u>Tuchila Farm Institute</u>	1965	£20,000
	1966	£35,000
	1967	£ 2,900
	1968	£ 3,230
	1969	£ 3,230
		<u>£64,360</u>

DISTRICT TRAINING CENTRES

Arising from the popular success of the farm institutes in Malawi, there has been a strong demand from village farmers and their wives for an expansion in training facilities to provide simple practical tuition in aspects of crop and animal husbandry pertinent to the day-to-day development of village crops. Accordingly it is planned that each extension area should be provided with simple but adequate facilities which would permit the training of groups of village farmers on short courses of not more than two to three days and dealing with the immediate problems of village agriculture. The training would be as practical as possible.

The District Training Centres (of which 27 are envisaged) would be of simple design and would comprise an office, classroom for 30 people together with dormitory accommodation and locking facilities. They would provide not only a base for practical training but also a focal point for all agricultural extension work. In many places buildings already exist and funds will be used to improve facilities available.

The effective use of District Training Centres would result in training for a large number of village farmers who could not hope to benefit from the more sophisticated training given at Farm Institutes nor who could be visited regularly by the strictly limited number of extension officers. The centres offer a highly effective means of reaching large numbers of people and of influencing their agricultural practices to a greater extent than has been possible in past years.

Projected Expenditure	1965	£10,000
	1966	£18,150
	1967	£ 9,200
	1968	£ 6,650
	1969	£ 6,650
		<u>£50,650</u>

BUSES FOR AGRICULTURAL TRAINING CENTRES

Three school buses are being purchased to transport student farmers, attending courses at Malawi's three farm institutes, to and from field days and educational visits which form part of the curricula of the institutes. The provision of the buses will greatly facilitate and improve the scope and range of instruction for student farmers undertaking courses at the institutes which serve each of the three Regions in Malawi. Finance for the purchase of the buses is being made available from the United Kingdom Freedom from Hunger Campaign Committee.

Projected Expenditure	1965	£6,500
-----------------------	------	--------

CROP PRODUCTION SCHEME

COTTON DEVELOPMENT

Increased cotton production has the highest priority in the Ministry's programme for economic development in the agricultural sector. Research advances have removed what was previously the main limiting factor to increased cotton yields, namely inability to control a complex of insect pests. In the past cotton production has been confined to lakeshore areas and the Lower Shire Valley where conditions permitted yields averaging 300 to 350 lb. of seed cotton which was sufficient to make production worthwhile to the producer. The advent of practical methods of pest control makes possible yields up to 1,500 lb. per acre in the existing growing areas but also the spread of the new crop at a similar yield level into many thousands of acres of land at rather higher altitudes where the incidence of pest attack has, in the past been so severe that only insignificant and sub-economic yields were attainable.

The introduction of spraying to local cotton producers involves the demonstration, teaching and supervision of comparatively sophisticated techniques, while, since there is a complex of pests which necessitates the use of three different insecticides to effect their control, a spotting service has to be provided which will forecast changes in the pest population and notify farmers when they should change from one insecticide to another. Accordingly, the major portion of the scheme for cotton development involves the employing of additional staff as demonstrators and provision of housing and transport for them. Construction of three training centres is proposed. Provision of water supplies is an essential prerequisite to expansion of the cotton acreage in the Central Region and construction of 60 boreholes is planned for there. In addition 60 miles of road for cotton extraction will be made.

The scheme is complemented by a subsidy scheme administered and financed by the Farmers' Marketing Board whereby cotton sprayers are available to farmers at 40% of their normal price, and by the provision of credit facilities for the purchase of insecticide.

The cotton development scheme aims at increasing the production of cotton from the 1964 figure of 15,000 tons to 34,000 tons by 1970. While in relation to world production this latter amount is negligible and there should be little difficulty in disposing of the crop, nevertheless the net addition to the national income using current prices would be approximately £1,860,000 over a period of 6 years and £660,000 annually thereafter.

Projected Expenditure	1965	£ 19,574
	1966	£ 28,828
	1967	£ 28,662
	1968	£ 30,690
	1969	£ 24,399
		<hr/>
		£132,153
		<hr/>

TEA DEVELOPMENT

The object of this scheme is to develop tea growing by Malawians on customary land and on land acquired by Government. Extensive areas for the growing of tea are available in the Northern Region, more particularly in the Nkhata Bay District, and to a lesser extent in the Mlanje and Cholo districts of the Southern Region.

Funds for this project will be used for the establishment and maintenance of nurseries, ring barking and planning on new holdings, survey work, establishment and maintenance of demonstration areas and for transport of supervisory staff.

Tea should, on a long term basis, provide a worthwhile and reliable income (in the region of £40 per acre on present prices) to large numbers of small holders provided that high standards of growing, plucking and manufacture are maintained. It should be stressed that maximum yields per acre of the best quality leaf must be obtained to make the individual enterprises worthwhile.

Projected Expenditure	1965	£ 15,000
	1966	£ 20,000
	1967 - 1969	£190,000
		<hr/>
		£225,000
		<hr/>

TURKISH TOBACCO DEVELOPMENT

This project in its initial stages is intended to apply only to Mzimba and Rumpi Districts in the Northern Region and Kasungu District in the Central Region. Opportunities for paid employment within this area, which forms a single geographical entity, are very limited and development of cash crops offers the only practicable means of increasing the cash income for the area. Furthermore, owing to the comparative remoteness of the areas and the consequent high cost of marketing, it is important that any cash crops should have a high value-to-weight ratio. Turkish tobacco fills this requirement as well as absorbing the services of otherwise unemployed family labour.

The growing of Turkish tobacco presents a series of difficult technical problems so that intensive supervision is essential at all stages. This involves the employment of additional highly trained and mobile staff. For these reasons a large proportion of the development provision is being devoted to the employment, training and equipping of additional supervisory staff and the provision of transport for existing extension staff of the Department of Agriculture. The other basic requirements of the development programme are the provision of additional water supplies for nurseries and the improvement of communications. Just under 200 boreholes are planned to be sunk and 90 miles of road constructed.

The object of the scheme is to increase Turkish tobacco production from the 1964 level of 85,000 lb. to about 1,300,000 lb. in 1969. Valued at current prices this represents a gross return to growers of just under £250,000, which would form a substantial injection of capital into these particular areas.

Projected Expenditure	1965	£ 42,000
	1966	£ 36,000
	1967	£ 16,500
	1968	£ 16,500
	1969	£ 16,000
		<hr/>
		£127,000
		<hr/>

INCREASED LIVESTOCK PRODUCTION

This scheme is complementary to the project Livestock Improvement and is aimed at further stimulating increased livestock production over the next five years by increasing and improving Animal Husbandry Extension work and by purchasing livestock for resale.

This will be implemented by the establishment of demonstration units at Farm Institutes and district training centres, provision of extension visits and materials, and purchase of stall feeders, some breeding stock and oxen for resale.

Projected Expenditure	1965	£ 6,000
	1966	£ 8,000
	1967	£10,000
	1968	£12,000
	1969	£12,000
		<hr/>
		£48,000
		<hr/>

SUGAR SMALLHOLDERS SCHEME

The object of this scheme is the production of sugar cane by smallholders in association with the estate production of sugar. Development of the project is in the initial stages only and detailed planning will be dependant on the recommendations of the Lower Shire Survey Team. As a result most of the development under the sugar smallholders scheme will take place after 1965.

Projected Expenditure	1965	£ 1,000
	1966-69	£ 99,000
		<hr/>
		£100,000
		<hr/>

RUBBER SMALLHOLDERS SCHEME

The principle of this scheme is similar to that of the sugar smallholders scheme whereby smallholders operate in the vicinity of estate grown rubber. It is planned that the scheme should operate in conjunction with an old established plantation in the Nkhata Bay District.

Projected Expenditure	1965	£ 1,000
	1966-69	£ 99,000
		<hr/>
		£100,000
		<hr/>

DEPARTMENT OF VETERINARY SERVICES

ANIMAL INDUSTRY AND FISHERIES

CONTROL OF DISEASE

This is a continuation of a scheme started in 1962, which provided for the construction of 42 dip tanks and ancillary facilities including field laboratories.

Malawi has a human population of approximately four million people and a cattle population of just over 400,000 yielding about 35,000 carcasses per annum. In order that the cattle population can make a greater contribution to the limited supply of animal protein now available, it is necessary to achieve as great a control of cattle disease as possible. The main diseases affecting cattle in Malawi are tick-borne, and it is the function of the dipping service to prevent an undue incidence of these tick carried infections.

The completion of the programme in 1965 involves the construction of two dipping tanks, both in the Kasungu District. This District has hitherto not been served by any Government dipping services but a population increase from 11,029 cattle in 1954 to 15,918 cattle in 1964 gives ample justification for an intensification of Veterinary Department activities in this District. As well as their function in the prevention of tick-borne diseases, the dip tanks serve a valuable role for other activities such as castration, work control, rabies control, poultry sales, demonstration areas and for the holding of extension meetings.

Expenditure prior to 1965	£23,638
1965	£ 2,012

CATTLE MARKETING AND HOLDING GROUND

This item also completes a scheme commenced in 1962. Prior to 1962 the major activity was the development of the Mpemba Holding Ground and Quarantine Station to facilitate the holding of cattle purchased at markets, which are surplus to the immediate requirements of the Cold Storage Company's Blantyre abattoir. This development has been completed, as has the construction of three cattle markets.

The 1965 programme involves the construction of cattle markets, complete with weighbridges. The purpose of these markets is to provide to the producer in rural areas the opportunity of selling his cattle for prices based on weight and grade and to give an incentive for improved standards of animal management. The saleyards will provide markets for stockowners whose opportunities for sale of their stock in the past have been limited to infrequent visits by itinerant dealers or village butchers. These latter will be able to purchase their requirements much more easily, while cattle surplus to requirements will be purchased by the Cold Storage Company for consumption in the more densely populated areas of the Southern Region.

Some of the saleyards will be sited in the Northern Region, where the potential market has been virtually untapped. Suitable store cattle purchased at sales by the Cold Storage Company will be placed with farmers for finishing and in this way the shortage of higher grade cattle will be substantially reduced. An orderly marketing system is a prerequisite to any form of agricultural development, and accordingly the new markets will contribute materially to the growth of Malawi's cattle industry.

Expenditure prior to 1965	£26,895
1965	£ 8,905

CATTLE MARKETING

This scheme provides for the construction of additional cattle markets, the development of a stock route from the Northern Region and the development of holding areas for cattle after they have been purchased at markets and prior to their transfer to the Blantyre abattoir.

It is planned that the stock route, which will consist of strategically sited cattle holding pens with attendant's accommodation, will extend from Kafukule in North Mzimba to Mponela in Nchisi District. It will facilitate the movement of stock purchased by the Cold Storage Company in Mzimba and Kasungu Districts to the assembly and loading point at Mponela.

The holding areas are designed to keep cattle prior to despatch by road or rail to the south, and also enable them to regain condition after being trekked by their owners to the markets. In the first instance it is planned to proceed with the minimum development of a 3,000 acre area on the Kuti dambo near the railhead at Salima.

The stock route will reduce transport costs which would be incurred on a long road haul from the Northern Region, while the holding grounds permit flexibility in the movement of stock in relation to transport availability and the demand for beef.

Projected Expenditure	1965	£ 9,525
	1966	£ 6,250
	1967	£ 4,535
	1968	£11,845
	1969	£ 8,845
		<hr/>
		£41,000

LIVESTOCK IMPROVEMENT

This item covers five projects - beef feeding trials, artificial insemination, expansion of the Mikolongwe Poultry Centre, provision of livestock subsidies and development of a rural dairy industry.

An important problem in connection with the expansion of Malawi's beef industry is an evaluation of the economics of intensive feeding of specialised beef stock and the finishing of animals from village areas. The aim of these trials is to provide a pointer to the most efficient and economic methods of finishing beef, in order that Malawi high grade beef can be produced profitably and replace imports. These are currently valued at £480,000 (1,200 carcasses).

Livestock breeding improvement work is to be accelerated by opening an artificial insemination project at the Mikolongwe Livestock Improvement Centre in the Southern Region and extending the scheme later to the other regions. This will supplement the dissemination of improved Malawi Zebu bulls and heifers already being carried out from Livestock Centres, and will enable blood of superior Zebu strains to be injected into village herds thus speeding up genetic improvement of these herds. The scheme envisages village cows being brought to the Centre for insemination and the importation of semen.

The main function of the Poultry Centre at Mikolongwe has been the distribution of six week old Black Australorp birds throughout the country. Crossed with village birds a much better carcass and larger eggs are produced. The development plan involves extension and renovation of deep litter houses, establishment of a battery unit comprising 2,068 cages, purchase of an economical vehicle for egg delivery, purchase of a steam cleaner and fogging unit, improvements and extensions to brooder houses, purchase of additional brooding equipment, purchase of an additional incubator, establishment of a broiler unit, construction of a pig unit where waste foodstuffs will be utilised, improvements to staff housing, and the construction of holding centres at distribution points. The aims are four fold, the improvement of

existing facilities to minimise incidence of disease, to expand the production of growers, caging of birds to detect Lucosis carriers, and the production of eggs and broilers for sale to Government institutions.

It is evident that the poultry population of Malawi, the total extent of which is unknown, plays a significant role in the provision of animal protein to the diet. Interbreeding with Mikolongwe bred improved stock will increase production in these flocks.

Provision of egg and meat production units on the Centre not only assists in spreading overheads, but the supply of these commodities to Government institutions can be expected to promote the taste for these foods, which will extend to a larger mass of consumers and thus raise nutritional levels among the populace as a whole.

Projected Expenditure	1965	£ 32,705
	1966	£ 28,195
	1967	£ 28,100
	1968	£ 28,000
	1969	£ 44,000
		<hr/>
		£161,000
		<hr/>

DISEASE CONTROL

The objects of this scheme are three fold, the control of tick-borne disease, of tuberculosis in cattle particularly in the Northern Region, and expansion of the scheme for rabies control.

The plan provides for the construction of four dip tanks and ancillary facilities. The tanks are purchased as prefabricated steel units, which are assembled in Malawi and installed at the sites, together with dip stores, staff housing and cattle crushes.

The tuberculosis programme is primarily for the Northern Region, and will consist of the vaccination of calves with B.C.G. vaccine. Preliminary tests are being carried out at the time of writing, and the full scale scheme will commence when the results of these tests are known. A complex of crushes to handle cattle are being constructed, and these will be available for use in any campaigns necessary to protect Malawi from invasion of epizootic diseases, (foot and mouth disease or rinderpest). It will also be necessary to purchase field refrigerators and carrying flasks and a 4 wheel drive vehicle to enable vaccines to be preserved during field campaigns.

The provisions for rabies control caters mainly for the purchase of vaccine.

The success of the Veterinary Department's system of dip tanks is proved by the virtual absence of tick-borne disease where cattle are regularly dipped. The extra tanks are planned to extend these facilities into areas hitherto unserved by dip tanks.

The high incidence of tuberculosis in cattle in the Northern Region has led to large numbers of carcasses being condemned after slaughtering. It is not practicable to test and slaughter infected animals under village conditions since the imposition of a test before sale would probably lead to healthy cattle only being sold and exported resulting in an increase in the population of tuberculosis infected cattle in the north. The ideal result of a B.C.G. vaccination campaign would be the elimination of tuberculosis from the national herd.

Although it is impossible to forecast the reduction in rabies cases which will result from this scheme almost any expense is justified to reduce the danger to human life from this terrible disease.

Projected Expenditure	1965	£10,160
	1966	£16,000
	1967	£15,900
	1968	£ 9,800
	1969	£ 4,140
		<hr/>
		£56,000

GENERAL FISHERIES DEVELOPMENT

This project provides for an increase in the establishment of the Fisheries Division over the Development Plan period. The present organisation is totally inadequate to undertake the work required in expanding both the commercial and the local fisheries operating on the three lakes of Malawi, Malombe, and Chilwa.

The project includes provision for :-

- (a) FISHERIES EXTENSION STAFF 5 additional Fish Rangers (Technical Officers) and 13 Fisheries Assistants will be recruited. One of the Fish Rangers will be a specialist in fish marketing and will initially work on Lake Chilwa (see Fish Marketing Project). Other officers of the Division will be engaged on extension duties and will be responsible for maintaining regular contact with fishermen, teaching proper methods of fishing, the handling of equipment and the processing of catches.
- (b) FISHERIES LAUNCHES Additional launches will be required and provision is included for the overhaul of the existing 35 foot launch the "Search", and the purchase of two additional vessels of the same size. These launches will be used for extensive patrolling on the lakes. Additional smaller craft will also be purchased.
- (c) Access to the main fishing beaches is essential if catches are to reach markets in good condition and 28 miles of road are planned in the Fort Johnston District; in addition landing facilities and jetties will be constructed where required.
- (d) The Fisheries Assistants at present employed by the Division have received only limited training and are of low educational standard. If an efficient organisation is to be built up facilities must be provided for proper training and provision is included for the training of staff to a standard equivalent to other natural resources departments. Provision is included for the recruitment of a training officer and the construction of dormitory accommodation, a teaching block and staff housing. This training scheme is essential to the efficient exploitation of this very valuable natural resource.

Projected Expenditure	1965	£ 3,000
	1966	£ 86,450
	1967	£ 12,950
	1968	£ 12,950
	1969	£ 12,950
		<hr/>
		£128,300

FISH MARKETING (Lake Chilwa)

The recent survey of fish landed from Lake Chilwa in the Southern Region has indicated that the catches are considerably higher than had been anticipated. The 1964 figures are over 4,000 tons.

Marketing of fish from Lake Chilwa has been haphazard and this project will improve the present facilities for handling fish at the main landing station near Kachulu. The Food and Agriculture Organisation of the United Nations has gifted an Ice Plant and made available the services of a Fish Marketing and Processing Adviser. The plant has been installed together with housing for staff.

Provision has been made for the landing jetty at Kachulu to be enlarged to meet the volume of traffic now using the all weather access road.

In 1966 the Fisheries Marketing Adviser will be replaced by a Fish Marketing Officer and ancillary staff. Provision has been included for this in the General Fisheries Development Project.

Projected Expenditure	1965	£ 5,000
	1966	£14,590
	1967	£ 3,650
	1968	£ 3,700
	1969	£ 3,523
		<hr/>
		£30,463

TRAINING INSTITUTE FOR FISHERMEN

The object of the Training Institute for Fishermen, which has been constructed at Mpepwe Hill on Lake Malawi, is to train subsistence fishermen to operate on a commercial scale, to provide training in the operation of modern gear, equipment and mechanised boats, to provide training in simple commercial practices necessitated by full time fishing and to provide this training in a location related to the main fishing areas of the country.

This scheme forms part of the overall development of fisheries on Lake Malawi and is a Freedom from Hunger Campaign project supported by the Aberdeen, Scotland committee. The buildings of the institute comprise a classroom block, a boat shed/net store, single and married student quarters, and staff housing. Equipment includes four 20 foot locally built boats, 4 outboard motors, nets and gear, tools, a film projector and accessories.

Expenditure

Buildings and Equipment

Prior to	1965	£ 9,262
	1965	£ 8,128
		<hr/>
		£17,390

Personnel and Other Charges

	1965	£ 1,595
	1966	£ 3,775
	1967	£ 3,959
	1968	£ 4,137
	1969	£ 4,233
		<hr/>
		£17,699

DEPARTMENT OF FORESTRY AND GAME

AFFORESTATION UNITS

Although Malawi has considerable areas of natural woodland, tree species suitable for general purpose building timber or furniture wood are very few and the quantity of timber available very limited. The major deficiency is in softwood building timber, the demand for which rises steadily as development progresses and general living standards rise.

This project provides for the continued expansion and management of timber plantations with an eventual target of 70,000 acres aimed at making Malawi self sufficient in building timber by 1990. There are at present 26,500 acres of plantations, and although the great majority are less than 15 years old, seasoned and graded constructional timber, boxwood, and transmission and telephone poles are being produced in limited quantities and sales were over £32,000 in 1964.

The main plantation centres are at Zomba, Dedza, the Vipya plateau and smaller areas around Limbe/Blantyre. The annual planting programme is 1,500 acres, and road construction, fire protection, staff housing are involved as well as the routine forest operations of tending, pruning and thinning. This development provides employment for 3,000 persons often in areas where there is little or no alternative employment.

Projected Expenditure	1965	£ 219,500
	1966	£ 213,000
	1967	£ 216,000
	1968	£ 236,500
	1969	£ 240,000
		<hr/>
		£1,326,000

VIPYA PULPWOOD PLANTATIONS

The conifer species planted for timber in Malawi are also suitable for the production of long fibred pulp used as a raw material by paper and paperboard manufacturing industries primarily for the production of wrapping and packaging materials. World shortages of pulp, particularly in Western Europe, are forecast from 1970 onwards, and a study by F.A.O. has reported favourably on the establishment of an export pulp industry in Malawi geared to come into production in 1975.

The Vipya plateau in the Northern Region has sufficient land in one compact block to establish the 88,000 acres of plantations required to supply the proposed bleached kraft pulp mill which will have an annual output of 100,000 tons of dry pulp. Low establishment costs and high rates of growth combine to provide pulpwood at a much lower cost than in most other parts of the world, and the large quantities of water required by the industry can be obtained by siting the pulp mill on the shore of Lake Malawi. The value of the resultant export trade is estimated at some 5 million pounds per annum.

It is planned that during the next 10 years the area of plantations required will be planted and the pulp mill will come into operation in 1975. 12,000 acres of existing plantations are included and the programme involves the preparation and planting of 7,000 acres per annum, together with the construction of some 50 miles of access roads, the provision of a fire fighting organisation and construction of staff housing; employment will be provided for nearly 2,000 labourers.

The Canadian Government have undertaken to finance the feasibility survey of the pulpwood project as part of their Technical Assistance Programme and a firm consultants from Canada have now been engaged.

Projected Expenditure	1965	£128,000
	1966	£100,000
	1967	£110,000
	1968	£122,000
	1969	£140,000
		<hr/>
		£600,000

FORESTRY RESEARCH

The afforestation projects (for the supply of timber and pulpwood) must be supported by research work aimed at improving yields and the quality of timber, improving and reducing the cost of technical operations and investigating possible forest pests and diseases and devising counter measures.

This project provides for staff and field expenditure primarily related to two new research projects, forest entomology and tree breeding. A small unit will be set up under the direction of a forest entomologist to undertake a complete investigation of existing insect pests, to provide a continuous check on populations of potentially dangerous species and to devise counter measures in the event of a possible epidemic.

The tree breeding project is designed to select and improve the tree species used in afforestation programmes with the object of increasing yields and improving timber quality both in relation to saw timber and pulpwood.

Projected Expenditure	1965	£ 2,700
	1966	£11,700
	1967	£ 4,300
	1968	£ 4,300
	1969	£ 4,400
		<hr/>
		£27,400

FORESTRY TRAINING

While professional forestry training is undertaken overseas, the Malawi Forest School at Dedza plays a vital part in providing technical personnel trained in forestry. Already, half the technical officers in the Department of Forestry are local officers who have passed through this School, and three quarters of the technical assistant grade are also school trained. The provision made in this projects meets the continued cost of the operation of the School.

Projected Expenditure	1965	Nil
	1966	£ 7,500
	1967	£ 1,500
	1968	£ 1,500
	1969	£ 1,500
		<hr/>
		£12,000

SAWMILLING

As noted in the Afforestation Project, Government plantations are now producing seasoned and graded constructional timber and boxwood. Production is at three sawmills, at Blantyre, Zomba and Dedza, and will double in five years time.

The existing sawmills require additional machines to saw the increasing production, and it is necessary to replace logging equipment used in extracting logs from the plantations. The project provides for the purchase and installation of this equipment.

Projected Expenditure	1965	£20,000
	1966	£21,000
	1967	£13,000
	1968	£13,000
	1969	£13,000

£80,000

HONEY AND WAX PRODUCTION

This small scheme commenced in 1963 with the employment of a qualified Beekeeping Officer with previous experience of honey and wax production in Africa. Conditions for beekeeping in Malawi are favourable and markets exist for high quality beeswax in Europe and for honey locally and in Rhodesia. The provision of local marketing facilities for beeswax, coupled with demonstrations of the correct preparation of this commodity and simple beekeeping techniques, has led to increasing numbers of farmers becoming aware that they can substantially increase their incomes by keeping bees and marketing the wax and honey. This scheme, although small and in its early stages, is gaining momentum now that staff trained by the Beekeeping Officer are working in various parts of the country.

The project provides for staff salaries, transport and equipment.

Projected Expenditure	1965	£ 4,200
	1966	£ 4,200
	1967	£ 4,200
	1968	£ 4,200
	1969	£ 4,200

£21,000

DEVELOPMENT OF GAME RESERVES

Development is being concentrated in the new National Park on the Nyika Plateau, the Kasungu Game Reserve and in the Lengwe and Mwabvi Game Reserves in the southern part of the country. The Nyika provides unique highland scenery which is the haunt of eland, roan and zebra, while improved trout fishing is available as a result of stocking and the building of small dams. Kasungu Game Reserve provides an entirely different habitat, and elephant, buffalo, rhinoceros, kudu, roan and sable can be viewed. The Lengwe reserve is primarily a sanctuary for nyala, a rare antelope.

The project provides for the development of these reserves as part of the national heritage and as tourist attractions. The programme includes the building of roads within the reserves (both for tourists and to aid in the task of checking poaching activities), the construction of properly equipped chalets and accommodation principally on the Nyika and in the Kasungu reserve, and the construction of dams to provide permanent water for game. The first of the Nyika chalets was open to the public in April, 1965, and the game camp in Kasungu reserve will be open to the public for the first time in July, 1965.

Projected Expenditure	1965	£ 7,000
	1966	£11,100
	1967	£14,300
	1968	£ 9,800
	1969	£ 6,800

£49,000

DEPARTMENT OF GEOLOGICAL SURVEYS

ECONOMIC MINERAL SURVEY

The object of the Economic Mineral Survey is to obtain a preliminary overall assessment of the country's mineral potential within the period of the present Development Plan.

To achieve this object it is intended to complete the systematic geological examination of the entire country by means of reconnaissance survey intended for publication at a scale of 1:250,000, to carry out systematic geochemical drainage reconnaissance, particularly over those parts of the country with appreciable soil cover, and to obtain a preliminary assessment of mineral occurrences brought to light by this or other work. Finance under the plan will provide for additional staff and their logistic support, laboratory expenses and analysis, pitting, maintenance and running expenses of drilling equipment, extensions to the Department's laboratory, printing of publications, aerial photography and instruments and equipment.

The geological maps to be prepared are an essential prerequisite for the exploration and exploitation not only of metallic ores, but also of such minerals as non-metallic ores, moulding sands, refractory materials and limestone.

Projected Expenditure	1965	£ 74,722
	1966	£ 81,298
	1967	£ 81,970
	1968	£ 80,260
	1969	£ 81,750
		<hr/>
		£400,000
		<hr/>

DEPARTMENTS OF LANDS AND SURVEYS

AERIAL SURVEYS

This project embraces the completion of photography for township mapping, and an aerial photographic survey of Malawi. The purpose of the large scale survey is to evaluate statistically, with a known degree of accuracy, trends in land utilisation. This will assist in the planning of development projects and assist generally in the fuller utilisation of the country's natural resources. The photographs will also assist in providing information on population distribution and settlement density.

The Department of Overseas Surveys in Britain has arranged that initially the more densely populated southern part of Malawi, south of 13° S'S, will be photographed and this will be followed in 1966 by photography of the remainder of the country.

Projected Expenditure	1965	Token
	1966	£ 50,000
	1967	£ 25,000
	1968	£ 25,000
	1969	£ 25,000
		<hr/>
		£125,000
		<hr/>

ACQUISITION OF LAND FOR SETTLEMENT

Provision is included for the purchase of estates for resettlement in the more densely populated areas of the country. The scheme commenced in 1962.

Expenditure prior to	1965	<u>£212,372</u>
Projected Expenditure	1965	£ 54,577
Residual Liability		£283,051
		<hr/>
		£337,628
		<hr/>

SECTION C

THE NATURAL RESOURCES OF MALAWI

MINISTRY OF NATURAL RESOURCES

SECTION C

THE NATURAL RESOURCES OF MALAWI

This section describes the main crops produced in Malawi, livestock, fish production, forestry, game and the principal mineral deposits known to exist in Malawi, and indicates their importance in the context of the national economy.

Malawi is almost entirely dependent upon the exploitation of agricultural resources. This can be indicated from the National Income figures collected by the Central African Statistical Office between 1956 and 1963. The Gross Domestic Product of Malawi rose from an estimated £29.7 million to £46.7 million in 1963. Of these totals, in 1953 some 64% originated in the rural sector. By 1963 the proportion had fallen to 54%. Despite this fall the great preponderance of agriculture in the economy is clearly apparent. The figures, of course, have to be accepted with considerable reserve, since the total value of African subsistence farming and production can, at best, be only an estimate.

Malawi's exports in 1954 were estimated (excluding exports to Rhodesia and Zambia) to be just over £7 million in value, rising by 1963 to £10.8 million. Of these exports, 99% consisted of agricultural products, particularly of the following five major crops - tobacco, tea, cotton, groundnuts and pulses, with small quantities of tung oil, rice and coffee.

POPULATION

There is some controversy as to the true population of Malawi which will only be resolved when the results of the 1966 Census are compiled. The latest estimate of the population in 1963, indicates that the country contains about 3.7 million people. Until recently, it was assumed from the apparent increase in population between 1931 and 1945 that the rate of growth of the population was some 2.2% per annum. The latest estimates of population suggest either that previous population estimates were too low or the rate of growth is considerably higher. Of this population in 1963, about 120 to 125 thousand were in paid employment and 40% of these were employed in agriculture. The remainder of the working population were engaged either in subsistence farming or in agricultural production for sale.

LAND AND THE ECONOMY

Table I gives an estimate of the total amount of land available to support this population. Of the 22,000 sq. miles indicated as being available for productive purposes some 6,500 sq. miles have been classified as "good arable land". Of this 6,500 sq. miles it is estimated that some 5,000 sq. miles are at present under cultivation.

Tables II and III give the quantities and values of the principal cash crops. The striking thing about these tables is that the major crop of the country, maize, plays such a small part in earning cash. The figures for maize represent only apparent surpluses marketed after providing for rural subsistence. In the absence of a reliable agricultural census, only guesses can be made at the total amount of maize produced within the country. At the present low yield per acre, and if the rate of population growth is at all comparable with that which has (recently) been suggested, it is clear that most of the present uncultivated land will, in a comparatively short period, be required for production of food crops. The crucial problem therefore facing Malawi, is to improve in the first place, the method of cultivation of maize and to increase yields per acre so that production of cash crops is not blocked. Only thus can an agricultural surplus be achieved upon which the manufacturing economy can be developed. Malawi's immediate objectives in the

field of manufacture will be to supply the home market. At the present time manufactured exports amount to only 5% of the gross domestic product. The economic problem for Malawi is to exploit her resources in such a way as to supply this home market for manufactured goods.

Provided the problem of improving the efficiency of food production can be solved, it will be possible to develop the production of cash crops and thus to create, within the agricultural sector, a cash market for manufactures and services. Development of cash crops will inevitably concentrate upon the existing staples of the economy - tobacco, tea, cotton, groundnuts and pulses.

AGRICULTURAL PRODUCTS

MAIZE

Maize is by far Malawi's most widely grown crop and is the staple diet for a population estimated to be 3.7 million people. In 1963 the production was estimated to be just under $\frac{3}{4}$ million tons but without a detailed census it is impossible to estimate accurately the annual production.

Only small quantities of maize are exported, the figure for 1964/5 being only 15,647 tons. The Farmers Marketing Board retain a reserve of 10,000 tons against a crop failure and during most years there are cases of local shortages which make it necessary to use part of this reserve.

As mentioned earlier the increased production of maize is a vital part of the current crop production programme. At the present time yields per acre are dreadfully low but with improved land use and the application of fertilizers production could double during the next 5 years. This would release areas of land throughout the country for the production of cash crops.

TOBACCO

The possibility of increasing tobacco production will depend to a large extent upon the market factors. As the future of the main types of tobacco grown in Malawi will be dependent on market factors, the following extracts from the Minutes of the Natural Resources Sub-Committee of the National Development Committee are of interest and value.

BURLEY TOBACCO

Two types are produced locally :-

- (i) The local traditional type comprising a well textured and coloured leaf used almost exclusively for "roll-your-own" cigarettes and as a flavouring for pipe tobacco. Whilst the general demand for this type of tobacco is diminishing it is estimated that Malawi leaf will continue to be in fair demand and hold its present market for some time. There is little hope for further expansion of this market.
- (ii) The light "fluffy" type of Burley is in increasing demand on the world market - an increase stimulated due to the fact that production in Italy and Japan is now uneconomical, and to increased consumption.

Malawi suffers serious competition in the "fluffy" Burley market from both Rhodesia and Zambia. The Rhodesian crop is controlled with an estimated 1965 crop of 6 million lbs. Zambia has refused to control production and indications are that this will lead to an immediate over production of market requirements within the Central African area. There is a possibility that markets will expand in the long term but caution is necessary at the moment - markets should be studied and production kept only slightly ahead of projected demand.

The present world demand for Burley tobacco amounts to 688 million lbs. This tobacco is the basis of the American cigarette industry and is largely produced in America.

Generally speaking, world manufacturers appear to be more interested in the Rhodesian leaf as it is more akin to that grown in the States and Canada than the Malawi leaf which enjoys rather specialised markets in the United Kingdom and Hong Kong.

Malawi production for 1965 is estimated at five million pounds and meets the requirement of a steady market. It is unlikely that Malawi could market more than $5\frac{1}{2}$ million pounds until the future of the Zambia crop has been assessed by manufacturers.

Security for the Malawi crop lies in maintaining a high quality of leaf plus a reliable sustained level of crop. Malawi is fortunate in having systems of supervision, growing conditions and growing methods superior to Zambia which relies upon a partly co-operative and partly tenant system of growing. Whilst the leaf is of similar quality at the present time it is likely that the quality of Zambia leaf will drop due to inability to give adequate supervision to such rapid increase in total crop production.

Note should be taken of the possibility of the introduction of synthetic substitute flavourings designed to alter the natural smoking characteristics of tobacco and affecting all but the heavy types of leaf. The commercial introduction of this process could revolutionise the entire tobacco industry and kill the specialised Burley trade.

FLUE CURED TOBACCO

The market potential for the development of the flue-cured crop is limited by over production throughout the world. America alone is embarrassed by a stock-pile of some thousand million pounds which it is anxious to off load on the world market at the earliest opportunity.

The Malawi market is largely kept alive by the I.T.C. and local tobacco manufacturers; it is unlikely to expand to more than $3\frac{1}{2}$ million pounds.

Rhodesia produces a better leaf than Malawi with an annual production of 240 million pounds which accounts for 42% of United Kingdom purchases for this type of leaf. Any drop in United Kingdom purchases from Rhodesia would be met from America and would not benefit Malawi.

Flue-cured tobacco will continue to remain an important section of the economy in Malawi and every effort should be made to maintain high-quality production at the $3\frac{1}{2}$ million pound level.

DARK FIRED TOBACCO

This crop is the mainstay of Malawi tobacco production with an estimated crop for 1965 of some $22\frac{3}{4}$ million pounds. *Handwritten note: Crop at 32 million pounds. Current sales have amounted to 29.2 million.*

It is likely that current markets will be maintained within the foreseeable future although this could be jeopardised through excessive over production by inefficient growers.

The need is to maintain a steady level of annual production of high quality leaf in order to stabilise markets which are beginning to reflect a downward trend mainly due to increased sophistication of smoking tastes by African consumers.

Present production tends to be inefficient though cultural practices are by far the best ever achieved with many gardens having a plant population as high as 90%. Improved standards will result in increased yields which have

previously averaged 800 lbs/acre as distinct from 2,000 lbs/acre in the U.S.A. Some reduction in dark-fired tobacco acreage has taken place in the present season through the re-scheduling of certain localities to Sun-air tobacco.

SUN/AIR-CURED TOBACCO

No comment other than to note an expanded market of 5 million pounds.

TURKISH TOBACCO

No comment other than to confirm that Turkish Tobacco production could be rapidly expanded and that it can be grown effectively under certain basic conditions of soil and climate. It could not be used to replace other types of tobacco such as dark-fired as the soil in the areas of dark fired is too rich and plant growth too vigorous, giving a size of leaf in excess of market requirements.

From these notes it will be seen that the most striking increase is likely to be in Turkish tobacco which, however, starts from a very small base and it will be some years before it becomes really significant. Authorative estimates have been made that it would be possible to increase total tobacco production by about 10% to a total of 40 million lbs. by 1973. It will probably be undesirable to attempt to achieve this by extension of acreage and efforts will be concentrated on improving yields by improved methods of cultivation and fertilisation.

TEA

Tea was first introduced into Malawi in 1878 and has developed as an Estate grown crop until at present it provides some 30% of the foreign exchange earned by Malawi exports. The prospects for the World Trade in tea are at present the subject of much discussion and a conference has recently been convened by the F.A.O. in Ceylon. There is considerable danger of the over production of tea, particularly of the lower grades. In this respect Malawi is particularly vulnerable since the Malawi teas are generally classified as "plain teas", and used as fillers for higher quality teas. The local tea industry is very much alive to this problem and is concentrating its efforts on the improvement of quality by better plucking and improved tea making techniques.

At present there are about 30,000 acres under matured tea on the Estates and it is estimated that some 8,000 acres of good tea land still remains available for planting. Yields have improved over the past few years due to the gradual introduction of improved high yielding varieties and the development of fertilizing practices. There are other technical factors which the tea research staff are working on (such as minor elements, fertilizer effects, etc.) and there is also the influence of the type of jat grown - the old tea is a China-hybrid jat which on a gradual though slow replanting programme will eventually be replaced by improved varieties and strains of inherently higher potential quality. If the current programme of expansion in the tea industry continues, it is probable that the estates could increase their total bearing acreage by 1973, to some 38 thousand acres which would give a total crop, in a reasonable year, of about 42 million lbs. ✓

In addition, there is a tea development project to grow tea as a peasant grown crop and for this some 5,000 acres may be considered a foreseeable proposition for development during the period up to 1973. The total potential acreage on small-holdings could eventually prove to be considerably greater.

COTTON

Cotton has been grown in Malawi since 1910, mainly in the Lower Shire Valley and in areas along the lakeshore. Production and yields have fluctuated very widely in the past due to variations in the weather and the incidence of pests and diseases. The recent success achieved by the Joint Cotton Research Team at Gatooma have suggested that the problem of pests can be overcome by spraying methods, and if these methods are adopted by cultivators a very considerable expansion of cotton production

for a very small outlay by Government funds can be expected over the next 4 or 5 years.

The yield of cotton per acre has increased enormously as a result of these new spraying practices and the 1965 crop forecast shows an average of 500 lbs. per acre with between 1,500 and 2,000 lbs. per acre where cotton has been sprayed.

The latest cotton crop in 1964 was 15,000 short tons of seed cotton and there is no reason why this amount should not be doubled over the next 5 or 6 years. Part of the increased production will be absorbed by the proposed spinning mill to be established in Blantyre. The remainder will require to be exported but connections with the Lancashire cotton trade have always been maintained and this market should be amenable to expansion as the demand from Rhodesia falls off with the increase of their own production.

GROUNDNUTS

Production of groundnuts as an export crop is a phenomenon of the post war years but since 1949 production has increased progressively until 1962 a record surplus of 36,000 tons was achieved. Since then, largely owing to seasonal influences, the crop has declined but it remains one of Malawi's important export crops. The Malawi hand-shelled nut is particularly suitable for the confectionary trade and enjoys a premium in price over oil bearing nuts. A production target of 65,000 tons has been set for 1973 and it seems reasonable to expect that this quantity could be successfully produced and marketed.

The Malawi nut is popular with the confectionary trade largely because they are hand shelled and of good size as distinct from the smaller nuts of uniform types such as the Spanish Bunch or Gambia nuts. The Malawi nuts are also suitable and acceptable for oil expressing. "Mwitunde" which is the variety being encouraged compares on analysis of oil content as follows :-

Mwitunde	51.0 [%]
Gambia	45.8 - 50.4
Spanish Bunch	48.5 - 50.9
Chalimbana	46.0

Average of all varieties under test - 49.7%

Other varieties of groundnut are continuously under test and the factor of oil content is considered of equal importance to the nut suitability for the confectionary trade.

Every effort is being made to increase the production of groundnuts to the 65,000 tons which has been set as the target by 1973.

RICE

Rice is produced in Karonga, Nkhota Kota, Salima, Nsanje and Zomba Districts. There is a considerable potential for increasing the present production and during this last 10 years Malawi has found a ready market for its full production in Central Africa. Crop production figures from 1952 are set out in the following table :-

RICE PRODUCTION

TONNAGE (SHORT TONS) AND VALUE OF PADDY PURCHASED BY CO-OPERATIVES IN 1952 - 1964

YEAR	TOTAL TONNAGE	TOTAL VALUE
1952	2,437	55,301
1953	2,833	138,954
1954	3,410	127,447
1955	6,208	202,866
1956	3,502 M.T.	Deliver 135,793
1957	3,137 3846	301,353 107,626
1958	4,190 3801	370,115 132,184
1959	6,574 59611	568,103 187,917
1960	7,077 12611	1,197,636 232,020
1961	9,867	± air 34m 306,957
1962	5,135	94.9 T/MT 192,255
1963	4,687	145,642
1964	3,646	68,918

Rice mills are situated at Kilupula (Karonga), Nkhota Kota and in Limbe. A new mill will be constructed during 1965 and 1966 which will process the country's full production.

PULSES

Until recently, pulses were traded by normal commercial channels and little was known about their potential as an export crop. Since 1963, the crop has been handled by the Farmers Marketing Board and quantities sold have exceeded expectations. In 1964 exports of pulses nearly trebled over previous years and it can be expected that these will remain at a relatively high level. Pulses also form an important part of the food supplies of the country and a sources of protein which is unlikely to be replaced from animal sources. A production target of 67,000 tons has been set for 1973.

SUGAR

Until now Malawi has been an importer of sugar. For many years the potentiality of the Lower Shire Valley for the production of sugar has been carefully studied and plans are now being implemented for the production of Estate grown sugar. This production will be destined initially for the internal market and its economic effect will mainly be felt in the saving of a considerable amount of foreign exchange. Current consumption is thought to be between 14,000 and 18,000 tons per annum but provided local supplies can be made available at reasonable prices this could be considerably increased.

Further areas of land are suitable for sugar cultivation in the Lower River Districts and although no target has been set for future development, the initial objective being to supply the full internal requirements, the potential for an export of this commodity exists.

COFFEE

Arabica type coffee was an important crop on estates in the Southern region during the early years of this century. By 1910 annual production had reached 1,000 short tons but subsequently fell rapidly due to the build-up of pests, principally

White Stem Borer. Modern methods of pest control and better knowledge of cultural techniques have revived interest in the crop during the last 10 years both on estates in the Southern Region (where it is grown in conjunction with tung) and in many parts of the Northern Region by small-scale local farmers. Production on estates is not expected to develop beyond the existing level of between 60 and 100 tons per annum. In the Northern Region the target is to expand production to 1,500 tons by 1973. The achievement of this target is largely dependent on the following factors :-

- (a) Control of the fungus disease Fusarium stilboides. A programme of control based on the breeding of resistant varieties has been in progress for the last few years.
- (b) A considerable improvement in cultural techniques particularly aimed at ameliorating climatic conditions since rainfall is marginal in the coffee areas; also, the increased use of fertilizer.
- (b) Efficient processing and marketing.

TUNG

The development of tung as a cash crop was started on estates in the Shire highlands during the 1930's. During the past 15 years the Commonwealth Development Corporation's Vipya Tung Estate has planted some 5,000 acres of tung in the vicinity of Mzuzu in the Northern Region. The total planted acreage reached its maximum in 1957 (19,000 acres) since when the acreage has fallen steadily to its present level of around 12,000 acres. Despite the fall in acreage, production has shown a gradual rise as a result of improved management of the bearing trees including particularly the use of high-yielding clones bred by the Department of Agriculture and increased use of fertilizer. The species now grown is almost entirely Aleurites montana. The lack of interest in maintaining the full planted acreage of tung in the Shire highlands has been due to the wildly fluctuating prices obtained for the oil, these prices being entirely dependent on the quantity of oil being marketed by the two main exporting countries, China and Argentina. Under such uncertain conditions it is unlikely that production much in excess of the present 1,500 long tons of oil can be expected.

LIVESTOCK

In 1964 the cattle population of Malawi numbered 411,000, goats 480,000, sheep 74,000 and pigs 133,000. Although these represent an asset amounting to approximately £5,750,000, in actual fact and when compared with the human population the stock population is low compared with neighbouring territories, and the territory is not self sufficient for its meat supplies. The shortfall amounting to an average of some 1,500 carcass equivalents yearly consists mainly of the top three grades of beef. Although the supply of lower grade beef appears sufficient to meet requirements, this must be assessed against a low capita consumption of meat and a relatively small increase in average consumption would place a severe strain on the country's cattle resources. For this reason most of the efforts of the Veterinary Department are directed towards an increase in the cattle population through control of disease and application of better methods of husbandry.

Livestock slaughterings over the past 10 years are summarised in a table in the appendix. The average offtake of approximately 10% represents a considerably higher figure than that attained in countries bordering on Malawi. The average cold dressed weight of all beasts killed in Malawi may be taken as 283 lb. which indicates that considerable improvements are possible in increasing production through increased carcass weights. The estimated value of all slaughtering in 1964 was £625,000.

Commercial dairy production is mainly limited to the areas surrounding the larger townships of Blantyre/Limbe, Zomba and Lilongwe, which are supplied by producers both from estates and customary land. Milk produced on estates retails at between 9d and 10d per pint delivered. No public owned pasteurization facilities are existent, but one private firm supplying Blantyre/Limbe possesses a pasteurization plant. In addition to milk produced from commercial sources, there is a large amount of subsistence production. However, it is pertinent to note that the ordinary local indigenous cows produce only one or two pints daily, and the major avenue of production from these animals should be beef. In the past ghee production has provided a useful income to cattle owners living in the more remote areas where alternative sources of cash were limited, but with the extension of cultivation of cash crops to these areas and the more lucrative returns obtained from the sale of liquid milk ghee production has declined in recent years.

The hide and skin industry makes a small but useful contribution to Malawi's balance of payments. In 1964, 33,000 hides and 24,000 skins were exported, valued at £46,000. The standard of the Malawi humped hide is high, partly due to the comparatively better nutritional environment in Malawi, partly due to the excellence of the hide improvement services and partly due to the absence of damage due to tick bites, as a result of the wide coverage of dipping services in Malawi.

The poultry population of Malawi is not known, but it is evident that poultry must play a significant role in providing animal protein to the local people. The village fowl has the characteristics of hardiness, disease resistance and good mothering ability. In an attempt to combine these characteristics with those of increased body size, better egg size and increased egg production, the Veterinary Department has since 1953 been distributing chicks at 6 weeks of age to local poultry keepers all over the territory. The breed which by experience has proved to be the most suitable for these conditions is the Black Australorp, a dual purpose bird, the effects of the distribution of which are very evident to anyone travelling through Malawi. Distribution at 6 weeks enable the difficult brooding period to be undertaken at the breeding centre, and allows vaccination against 3 important diseases, Newcastle disease, fowl typhoid and fowl pox. Between 40,000 and 50,000 birds are distributed annually under this scheme.

FISH

The production of fresh water fish in Malawi is at present estimated to be in the order of between 12,000 and 15,000 tons. With Malawi's shortage of animal protein, fish are a vital part of the population's diet and considerable attention is being given to the development of the lake fisheries on Lake Malawi, Lake Chilwa and Lake Malombe.

Some 200 species of fish have been identified in Lake Malawi and of these six major groups are being exploited commercially :-

- | | | | |
|-----|----------------|----------|---|
| (1) | Tilapia | (Chambo) | |
| (2) | Labeo | (Nchila) | |
| (3) | Bagrus | } | Catfish |
| (4) | Clarias | | |
| (5) | Haplochromid | } | of importance to African fisheries only |
| (6) | Engraulicypris | | |

Of the types of fish mentioned, Tilapia are of most importance and are found in Lake Malawi, Lake Malombe and Lake Chilwa, the largest size of fish, however, is produced in Lake Malawi.

Fish production (in short tons) in recent years is estimated to be as follows :-

LAKE MALAWI	LAKE MALOMBE	LAKE CHILWA	YEAR
6,443.68	1,334.83	5,842.83	1964
7,643.00	2,892.00	2,004.00	1963

Two commercial fishing licences are in operation on Lake Malawi and a third licence will shortly be taken up by the Malawi Development Corporation who will establish a company which will be concerned with both commercial fishing and marketing.

The present marketing arrangements are extremely inefficient and the new Malawi Development Corporation will ensure that the present wastage of fish which has been estimated to equal one-third of the catch, reaches the consumer. A residual purchasing organisation will be established initially on Lake Malawi and Lake Malombe and later probably on Lake Chilwa also. The catches will then be processed and distributed either as cured fish or frozen fish to the main centres of consumption. Production on Lake Chilwa until recently was thought to be considerably less than Lake Malawi but a recent survey has indicated that production in the two lakes is almost the same. As a result more attention will be focused on the development of Chilwa fisheries and as a start a Cold Storage Depot has been established near the Lake. The next stage of Development will be a fish marketing system to reduce wastage to the minimum.

It is considered that an increased extension service for the Fisheries Division and the provision of trained Technical Assistants will result in an increased awareness of the basic principles of fishing and will enable conservatory regulations to be instituted which in turn must result in an improvement in the fish population of the lakes. It is expected that with properly controlled fishing by more efficient methods the natural yield could be raised to at least 17,500 short tons by 1983.

FORESTRY AND GAME

The Department of Forestry and Game controls and manages 2,915 square miles of state forests (forest reserves), and 1,660 square miles of National Park and Game reserves. The majority of the forest reserves are catchment areas and are managed with the primary objective of maintaining water supplies. Game reserves and game licensing were taken over from the previous Department of Game, Fish and Tsetse Control in 1962.

The main activities of the Department are listed below, followed by details of major work carried out over the last 5 to 10 years, the present production and trade position in relation to timber imports, and a brief description of future plans for an export pulp industry. Reference should be made to the descriptions of individual development projects for further details.

1. Management and expansion of timber and pulpwood plantations.
2. Management of protection forest reserves.
3. Management and development of the Nyika National Park and Game Reserves.
4. Sawmilling.
5. Forest Research.
6. Malawi Forest School.
7. Development of honey and wax production.

PLANTATION MANAGEMENT

The annual acreage planted in the main forest estate has shown a fairly consistent increase over the last ten years. Previous fluctuations due to weather conditions have now been overcome with new establishment techniques.

1956	2,190	acres
1957	2,107	acres
1958	2,334	acres
1959	2,309	acres
1960	3,166	acres
1961	3,929	acres
1962	3,031	acres
1963	3,423	acres
1964	3,877	acres
1965	5,865	acres

The sharp increase in 1965 is due to expansion in relation to the Vipya pulpwood project. The total acreage of plantations managed by the Department as at April, 1965, was 42,950, of which 38,384 acres constitute the main productive plantations, 3,131 acres are classified as experimental or amenity areas and 1,435 acres are in Local Authority Forests owned by District Councils but managed by the Department.

The progressive increase in expenditure on plantations is, however, largely due to the tending operations which have to be carried out over increasing acreages annually and, of course, to fire protection and logging costs. A summary of the acreages covered in the years 1960 - 1964 in various operations is shown below :-

<u>OPERATION</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>
Complete Cultivation	772	584	520	418	574
Spot Cultivation	884	2,795	2,266	3,141	2,401
Grass and Climber Cutting	7,427	9,445	13,039	11,014	11,562
Pruning	4,032	2,778	3,605	6,806	3,371
Thinning	678	1,284	1,864	1,898	4,445
Total Acreage	13,793	16,850	21,294	23,277	22,353

The Department constructs and maintains its own roads and internal telephone communications. Progress over the period 1960 - 1964 is shown below :-

	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>
Mileage of roads constructed	47	67	40	35	43
Mileage of Telephone Line Installed	8	21	11	10	11

As at the end of 1964, the Department maintained 543 miles of forest roads and 124 miles of telephone line.

OUTTURN FROM PLANTATIONS

Production from plantations is still small, as the great majority of the areas are under 15 years old. Up to 1963 plantation logs were sold to private sawmillers. These concerns, however, showed no sign of expanding to meet the increasing volume of logs available, and the decision was therefore taken in 1963 to install small Government sawmills, which came into operation in 1963 and 1964. Production of logs over the past five years is shown below. The log intake by sawmills in 1965 is expected to be 250,000 cubic feet.

1960	136,144	cubic feet
1961	100,781	cubic feet
1962	101,829	cubic feet
1963	147,825	cubic feet
1964	147,840	cubic feet

TRAINING

The Malawi Forest School operates a two year course, at the end of which successful students pass out as Forest Rangers (T.A. grade). A Forester (T.O. grade) course was commenced at the School in 1963 but shortage of teaching staff has precluded the continuation of this course although it is hoped to recommence in 1966. The numbers of successful students passing out from the School over the past five years are shown overleaf. The difficulties experienced in obtaining students for the Forest Ranger course with adequate entry qualifications have now largely disappeared.

	<u>FOREST RANGERS</u>	<u>FORESTERS</u>
1961	6	-
1962	5	-
1963	2	-
1964	7	5
1965	13	-

Candidates for Forester training are required to have passed out as Forest Rangers and have spent two years working in the field. Forester training has been carried out in the United Kingdom and Uganda apart from the five men trained in Malawi in 1964 who nevertheless completed their training with an additional 6 months with the British Forestry Commission in the United Kingdom.

There are at present 11 African Foresters, and 3 other African technical officers in the Department, representing just under 50% of the T.O. establishment. Three further men are under training in Uganda.

Training of professional officers is being undertaken abroad in universities in India and the United States. There are no African professional officers working in the Department at the present time. 5 men are at university, one is due to graduate in 1966, one in 1967, two in 1969 and one in 1970.

PRODUCTION AND TRADE OF FOREST PRODUCTS

The total value of all manufactured and unmanufactured wood products imported into Malawi in 1964 was £249,000. Major categories are shown below, with values to the nearest thousand pounds and volumes to the nearest thousand cubic feet.

	<u>VALUE</u>	<u>VOLUME</u>
1. Boxes, packing cases. tea chests, boxshooks	£143,000	100,000 cubic feet (estimated)
2. Sawn softwood (mainly construction timber)	£ 53,000	149,000 cubic feet (estimated)
3. Plywood	£ 6,000	12,000 cubic feet (estimated)
4. Blockwood, particle board and hardboard	£ 17,000	14,000 cubic feet (estimated)

CONSTRUCTION TIMBER AND BOXWOOD

Both construction timber and boxwood are produced by the Department's forest sawmills and finished boxshooks are manufactured for one local company at the Department's Blantyre sawmill. Production of sawn timber is expected to reach 80,000 cubic feet in 1965. Seasoned and graded construction timber is now supplied to Ministry of Works, and two thirds of their direct requirements for building timber will be met in 1965. Part of the remaining timber is sold as run of the mill grades and boxwood, and because of the four to six month seasoning period a considerable quantity of the annual production will still be awaiting completion of seasoning at the close of the year.

The boxwood market includes plywood tea chests which cannot be supplied locally at present, and specifications for other boxes are such that much plantation timber now available is too young to meet the requirements. However, £7,000 worth of finished boxwood will be supplied to one Malawi firm in 1956, and there are good possibilities for an expanding boxwood market locally.

A sufficient quantity of logs will be available from plantations to produce 150,000 cubic feet of sawn timber in 1966 rising to 300,000 cubic feet by 1969. It is anticipated that building development over the period 1965 to 1969 will greatly increase the requirement of softwood construction timber from that indicated by the 1964 import figures.

PRESSURE TREATED POLES

The Department's pressure creosoting plant produces treated electricity transmission poles, telephone poles and fence posts. Production of treated timber over the last five years is shown below.

1960	41,872 cubic feet
1961	53,947 cubic feet
1962	36,941 cubic feet
1963	28,577 cubic feet
1964	37,488 cubic feet

Prior to 1964 production was confined to transmission poles required by the Electricity Supply Commission of Malawi and treated fence posts. The supply of telephone poles to the Post and Telecommunications Department commenced in 1964, and apart from substantial increased orders from these customers in 1965, exports of transmission poles to Zambia commenced in 1965.

Sales were £10,000 in 1964, and 1965 orders amount to £20,000, of which £14,000 are in local orders and £6,000 in exports. The future outlook is encouraging and from enquiries already received it appears that sales of £50,000 might be expected in 1966, approximately half to local and half to export markets.

It should be noted that treated wooden poles replace imported steel poles, which are some 300% more expensive. The 1965 outturn will therefore avoid the import of some £60,000 of steel poles, against which must be set the import of £5,000 of creosote.

FUTURE REVENUE

Total departmental revenue in 1964 was £61,000 and the estimated revenue for 1965 is £80,000. The Department only commenced supplying graded and seasoned timber on any scale from its own sawmills in 1964, and is still some way from replacing imported construction timber at the 1964 level by local softwood. With the impetus given to building programmes by the current Development Plan a steady increase in production and revenue is forecast over the next five years.

FUTURE PLANS FOR AN EXPORT PULP INDUSTRY

The pulpwood plantations now being expanded at the rate of 7,000 acres per annum on the Vipya are planned to come into production in 1975. These plantations will be capable of supporting a daily production of 1,500 tons of pulpwood logs. This production is sufficient to supply a pulpmill producing 100,000 tons of dried bleached kraft pulp per annum, indicated as a unit of thoroughly economic size for this product in feasibility studies carried out by F.A.O. in 1964. The capital investment in the pulpmill would be £18 million and construction would probably have to commence in 1972.

World shortages of pulp are forecast by 1975, particularly in Western Europe, and the value of the resultant export is £5 million at present day prices. This industry would provide an export approximately equivalent in value to the present export of tea, and is therefore of major importance to the future economy. The Forestry development involved provides employment at a substantial level, and the local production of the necessary chemicals required by the pulp mill may make it practicable to set up a local fertilizer industry.

PRINCIPAL MINERALS

The only minerals at present being produced are stone, limestone and clay for constructional purposes. Known mineral deposits considered to be of some promise for future development are as follows :-

ABRASIVES

Corundum occurs at Tambani near Mwanza and in the Port Herald Hills, and the deposits at the former locality were worked between 1942 and 1952. Should there be an increase in the price of the mineral, profitable working could probably be resumed.

Zircon, another abrasive, is found at localities throughout Malawi, the largest deposits known being at Tambani and near Neno.

APATITE

Apatite is a phosphate mineral used in the manufacture of superphosphate fertilizer or may be applied directly to the soil. The main occurrence in Malawi is at Tundulu Hill in Mlanje District. Tonnages proved by the Geological Survey Department and a mining company are :-

Ore with over 20% P_2O_5	800,000 tons to a depth of 100'
Ore with over 10% P_2O_5	1,000,000 tons to a depth of 100'
Ore with approx. 5% P_2O_5	500,000 tons to a depth of 100'

Apatite is also known to exist in the Mlindi Ring Structure south of Neno and is to be investigated in detail in the near future.

BAUXITE

At least 60,000,000 tons of bauxite has been proved on the Mlanje Plateau and work is currently in progress to determine whether even larger tonnages exist. The deposit was considered unattractive for many years due to the presence of quartz in the ore but the removal of this impurity is now known to be a relatively simple matter.

Local production of aluminium would require a plentiful supply of cheap electricity but local production of alumina should not be too difficult if markets for this could be secured.

DOLOMITE

Many of the Malawi "limestones" are intermediate in composition between calcareous limestone such as found at Changalumi and magnesian limestone (dolomite). Such an intermediate type is worked at Lirangwe but its chemical composition limits its potential uses. True dolomites are known to exist in the Middle Shire area and would probably be quarried as a source of magnesia if a pulp mill is established in the country. Further deposits are currently being examined.

GRAPHITE

Gneisses containing graphite are common in much of the Central Region. At Katengeza west of Salima pitting and trenching have indicated 15,200 short tons of graphite to a depth of 6 feet in weathered gneiss averaging 5.1% graphite. The quality of the mineral is known to equal that of the crucible grades of Madagascar flake graphite and prospecting is taking place in the Central Region to evaluate other known deposits. At the same time the search continues for additional occurrences.

ILMENITE AND RUTILE

Ilmenite and rutile are important sources of titanium. The former is common in many rocks throughout the country but is concentrated in association with rutile in two areas - the southern end of Lake Nyasa and (more important) near Port Herald. Economic production will be possible at Port Herald when the value of the minerals increases.

KYANITE

Kyanite is a highly refractory mineral used for furnace linings and heat resistant bricks. The largest deposit of kyanite is found at Kapi ridimba, Ncheu District and in the period 1952 - 1954, 2,638 tons valued at £26,969 was produced. This removed the bulk of lump kyanite but diamond drilling has shown that 300,000 tons of kyanite are available from gneiss averaging approximately 20% kyanite. An extraction process has been devised but until such time as there is an increase in the world price of kyanite the large deposit must remain unworked.

LIMESTONE

Lime is of great importance to an expanding economy both for the production of cement and for agricultural purposes and Malawi is fortunate to have a large deposit of very pure limestone close to the main industrial centres. At Changalumi estimated reserves are 135,000,000 tons. Other limestones have been examined in detail and the search for good quality material further north in Malawi continues.

MICA

This mineral is used mainly by the electrical industry and the Geological Survey Department is currently investigating the mica-bearing pegmatites of the Mzimba District. Mica is also known to exist in other areas in Malawi. The size of individual sheets is the main determining factor when the value of the mineral is assessed.

MONAZITE

Monazite is a valuable source of both cerium and thorium and detailed examinations of two localities in Southern Malawi have taken place in recent years. The most promising occurrence of cerium monazite is at Kangankunde Hill, south-south-west of Balaka where it is a constituent mineral in an intrusion of carbonatite. The Geological Survey Department has undertaken a detailed investigation of the reserves of monazite at Kangankunde. The programme involved trenching and drilling and the following reserves have been indicated :-

	<u>Ore per 100' from surface</u>	<u>Monazite per 100' from surface</u>
Drilling Area One	86,453 tons	3,900 tons
Drilling Area Two	238,080 tons	14,196 tons
TOTAL	<u>324,533 tons</u>	<u>18,096 tons</u>

Overall average grade 5.58% monazite. In addition there are other areas on the hill where the grade is lower (about 3.5%) but where considerable tonnages are available.

Strontianite is found in association with the monazite and would (even if not worked for its own value) be an important by-product of any monazite production.

PYROCHLORE

Pyrochlore is a niobium-bearing mineral and substantial reserves are known to exist on Chilwa Island both in the carbonatite intrusion and in the derived soils. A very promising deposit of uranian pyrochlore at Ilomba Hill in the extreme north-west of Malawi is being examined by the Geological Survey Department. Other niobium-bearing minerals occur near Tambani Mountain, Mwanza District.

STRONTIANITE

Strontianite occurs in association with monazite at Kangankunde Hill. The chemical composition can be regarded as being very satisfactory and tonnages proved in association with the assessment of monazite reserves are :-

	<u>Ore per 100' depth</u>	<u>% Strontianite</u>	<u>Strontianite per 100' depth</u>
Drilling Area One	86,453	12.77	11,022 tons
Drilling Area Two	238,080	19.76	47,056 tons
	<hr/>		<hr/>
TOTAL	324,533		58,078 tons
	<hr/>		<hr/>

This tonnage could probably be doubled by processing other ore with a lower monazite content.

APPENDIX

TABLES OF STATISTICS

LAND USAGE (SQUARE MILES)
LAND IN WHICH CULTIVATION IS PROHIBITED

ADMINISTRATIVE DISTRICT	LAND AREA	FOREST RESERVES	GAME RESERVES	COMMUNAL FOREST & PROTECTED HILL SLOPES	UNUSABLE LAND FOR ARABLE AGRICULTURE, PASTURAGE OR FORESTRY	PRIVATE ESTATES	BALANCE (Land assumed usable for agriculture including fallow, natural grassland and woodland on shallow marginal soils, village sites, water courses.)
<u>Southern Region</u>							
Fort Johnston	2,414	422	-	12	416	22	1,542
Kasupe	2,328	125	-	8	314	2	1,579
Zomba	961	18	-	9	347	48	539
Blantyre Urban	80	-	-	-	34	46	-
Blantyre Rural	1,541	67	-	9	547	22	899
Cholo	672	36	-	6	223	197	210
Chiradzulu	295	2	-	3	127	43	120
Mlanje	1,331	177	-	23	260	75	796
Chikwawa	1,743	-	120	23	652	7	940
Nsanje	861	75	60	22	255	13	436
TOTAL:	12,229	922	180	115	3,175	475	7,362
<u>Central Region</u>							
Nkhota Kota	2,548	35	680	13	617	1	1,202
Kasungu	3,200	3	800	7	625	40	1,725
Dowa	2,008	33	-	50	331	47	1,547
Lilongwe	2,392	367	-	60	77	55	1,633
Dedza	1,400	205	-	50	347	14	864
Ncheu	1,307	39	-	12	501	18	737
Fort Manning	964	40	-	6	262	31	625
TOTAL:	13,819	722	1,480	198	2,760	206	8,453
<u>Northern Region</u>							
Karonga	3,045	78	-	2	1,200	12	1,753
Rumphi	1,817	4	-	1	800	3	1,010
Nkhata Bay	1,625	189	-	-	600	32	804
Mzimba	3,913	177	-	-	600	38	3,095
TOTAL:	10,400	448	-	3	3,200	84	6,867
TOTAL MALAWI:	36,448	2,092	1,660	316	9,135	765	22,470

T A B L E II

TOTAL PRODUCTION OF PRINCIPAL CROPS

Y E A R	T O B A C C O					Tea (Lb.)	Seed* Cotton (Sh.tons)	Ground* nuts (Sh.tons)	Tung Oil (Lg.Ton)	Maize* (Sh. ton)	Pulses (Sh. tons)	Coffee (tons)
	FLUE* (Lbs.)	FIRE* (Lbs.)	SUN/AIR* (Lbs.)	BURLEY* (Lbs.)	TURKISH (Lbs.)							
1954	4,305,663	23,598,853	3,298,679	1,949,375	-	17,180,000	7,802	7,327	1023	52,926	2,432	8.0
1955	3,693,808	14,781,752	2,323,794	2,017,457	-	17,500,000	9,579	10,322	980	43,264	6,347	13.4
1956	4,119,104	25,426,032	2,680,100	2,278,021	-	20,800,000	3,435	9,758	971	32,121	7,943	20.8
1957	3,014,709	25,540,610	3,034,731	2,173,274	-	18,090,000	4,634	13,872	1361	5,424	7,341	35.4
1958	2,197,859	30,895,224	2,509,134	3,208,984	-	23,290,000	6,121	12,785	877	12,822	6,035	51.0
1959	2,251,027	26,400,557	5,424,646	2,749,151	16.9	23,270,000	10,760	12,816	1504	12,015	3,881	96.0
1960	2,934,326	21,490,035	6,969,830	2,920,830	35.0	26,080,000	13,566	20,698	1226	16,613	6,000(est)	118.8
1961	2,317,638	15,627,521	5,221,557	3,553,997	64.6	31,520,000	12,963	25,906	1384	15,830	7,160	120.0
1962	2,604,781	25,272,316	4,332,446	3,937,446	68.1	29,410,000	19,030	36,225	1532	478*	7,000(est)	158.0
1963	2,700,000	26,300,000	5,200,000	4,500,000	96.7	27,300,000	10,611	27,620	1430	12,580	17,978*	174.0
1964	2,666,614	22,283,564	3,006,243	4,705,569	86.2	27,300,000	14,867	19,511	1475	30,815	16,818*	146.6

* Auction floor sales

* Sales to F.M.B.

TABLE III

VALUES OF AGRICULTURAL PRODUCE

YEAR	TOBACCO					Tea (2) £	Cotton (3) £	Groundnuts (3) £	Tung Oil (4) £
	Flue (1) £,000	Fire (1) £,000	Sum/Air (1) £,000	Burley (1) £,000	Turkish £,000				
1954	457	1,338	226	220	-	-	512,127	425,417	119
1955	418	1,183	202	227	-	3,127,276	623,328	341,508	134
1956	393	1,782	216	217	0.7	3,064,880	230,548	718,264	140
1957	339	2,025	313	317	0.2	3,010,537	276,909	814,463	130
1958	205	2,007	261	305	0.7	3,353,254	334,347	461,963	54
1959	264	1,277	525	255	2.0	3,300,659	582,929	878,842	149
1960	403	1,395	556	398	4.4	4,016,406	741,355	1,134,132	130
1961	275	1,243	319	362	6.2	4,944,820	741,327	997,808	251
1962	357	2,110	592	534	7.5	3,952,149	1,123,545	1,866,434	352
1963	369	2,060	491	554	10.4	3,776,133	743,260	1,725,745	NA
1964	362	18,421	312	772		NA	945,382		

(1) Auction Floor Realisation (3) Sales by Farmers Marketing Board

(2) Export Value (4) Export Value

TABLE IV

CROP PRODUCTION 1962-1964 ACTUAL AND FORECASTS 1973 AND 1983

Note: Transportation Report figures in brackets under "Forecast"

Crop	Actual Production (s.tons)			Forecast Production (s.tons)	
	1962	1963	1964	1973	1983
(1) Seed Cotton	19,030	10,611	15,000	32,000 (40,000)	42,750 (65,000)
(2) Tung Oil	1,530	1,652	1,600 (approx)	2,000 (2,000)	2,250 (2,250)
(3) Tea	13,700	12,360	14,000 (approx)	18,000 (20,000)	28,000 (30,000)
(4) Groundnuts	36,225	27,620	19,300	51,650 (65,000)	67,600 (98,000)
(5) Pulses	15,000	18,000	15,400	32,250 (67,000)	47,750 (104,000)
(6) Flue Cured Tobacco	1,302	1,333	1,354	1,380 (1,300)	1,630 (1,300)
(7) Fire-Cured Tobacco	12,636	17,000	8,316	11,000 (12,000)	11,000 (10,000)
(8) Air-Cured Tobacco	2,166	2,605	1,500	2,600 (2,560)	2,600 (3,000)
(9) Burley	1,969	2,240	2,350	2,500 (3,200)	3,000 (5,400)
(10) Turkish	34	48	43	800 (6,200)	1,350 (16,000)

TABLE V

LIVESTOCK POPULATION 1954-1964

	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Cattle	292,381	307,026	318,449	327,629	343,059	356,514	356,677	374,762	380,387	396,145	411,419
Sheep	52,642	78,709	66,643	57,719	61,961	75,297	69,098	82,223	77,757	81,918	74,139
Goats	322,738	326,113	354,561	360,808	412,606	460,611	442,622	529,458	493,184	438,488	480,295
Pigs	82,478	77,145	77,158	89,125	82,075	119,913	72,470	100,479	105,166	127,897	133,221
Donkeys	176	199	527	387	396	563	412	557	398	394	544

TABLE VI

INCIDENCE OF ANIMAL DISEASE 1954-1964

	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
Rabies	28	34	88	55	77	35	117	109	72	135	110
African Swine Fever	1	2	-	-	-	1	14	-	6	-	3
Blackquarter	1	-	-	2	4	12	10	7	7	6	5
Tuberculosis	17	28	8	9	12	21	116	121	132	117	68
Streptothricosis	3	-	-	-	2	5	3	8	-	3	-
Heartwater	25	18	18	48	41	6	9	3	2	5	4
East Coast Fever	240	107	123	143	118	147	296	287	311	505	715
Foot and Mouth Disease	-	-	-	1	-	2	-	-	1	-	-
Anaplasmosis	7	4	1	16	16	31	57	34	35	51	56
Piroplasmosis	52	22	35	66	63	42	86	156	135	133	133
Trypanosomiasis	101	106	121	100	130	250	189	128	224	75	85
Mange	16	4	10	17	13	-	-	-	4	-	-
Contagious Abortion	4	5	16	10	-	2	6	2	4	-	-
Newcastle Disease	-	3	5	18	5	63	39	12	16	6	27
Lumpy Skin Disease	-	-	-	1	-	-	-	-	-	12	26

TABLE VII

NUMBER OF LIVESTOCK SLAUGHTERED 1954 - 1964

	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
CATTLE	23,146	23,140	26,660	28,749	29,149	26,240	29,440	31,766	35,853	40,350	39,613
SHEEP	2,070	1,880	2,426	2,078	3,152	2,431	3,067	3,192	2,833	2,452	2,355
GOATS	11,860	13,371	13,795	15,433	15,421	15,264	15,773	18,656	18,233	18,103	22,535
PIGS	4,844	5,484	5,582	6,128	8,234	8,582	7,390	7,941	8,521	8,695	10,557

TABLE VIII

IMPORTS OF MEAT 1957 - 64

YEAR	BEEF (lb.)	MUTTON AND LAMB (lb.)	CLEAN OFFALS (lb.)	ROUGH OFFALS (lb.)
1957	106,032	-	-	-
1958	479,897	6,100	15,171	
1959	1,220,629	46,749	48,074	358,993
1960	591,621	56,523	55,358	242,593
1961	620,500	48,518	44,041	313,309
1962	535,918	59,109	20,472	251,774
1963	411,227	51,563	22,193	190,456
1964	294,102	78,380	10,693	51,277

TABLE IX

IMPORTS OF LIVE CATTLE TO MALAWI FROM ZAMBIA 1960 - 64

1960	703
1961	711
1962	739
1963	871
1964	489

TABLE X

EXPORT OF HIDES AND SKINS 1954 - 64

	HIDES		SKINS	
	NUMBER	WEIGHT (lb.)	NUMBER	WEIGHT (lb.)
1954	Dried Salted	13,063 6,847	20,474	31,356
1955	Dried Salted	12,803 9,388	24,684	51,250
1956	Dried Salted	9,229 8,831	25,292	34,958
1957	Dried Salted	3,886 14,289	24,934	32,370
1958	Dried Salted	4,884 14,876	24,753	34,444
1959	Dried Salted	4,760 7,500	22,492	31,995
1960	Dried Salted	19,430 200	25,418	34,115
1961	Dried Salted	27,557 6,903	43,600	55,287
1962	Dried Salted	23,150 7,746	34,722	45,072
1963	Dried Salted	16,750 9,116	31,340	35,707
1964	Dried Salted	24,420 8,906	24,165	27,938

TABLE XI

ESTIMATED TOTAL PRODUCTION OF FISH (SUBSISTENCE AND COMMERCIAL) 1954 - 64

	(Short Tons)
1954	3,500
1955	4,000
1956	4,500
1957	7,705
1958	7,290
1959	6,150
1960	6,400
1961	8,654
1962	12,766
1963	12,539
1964	13,621

